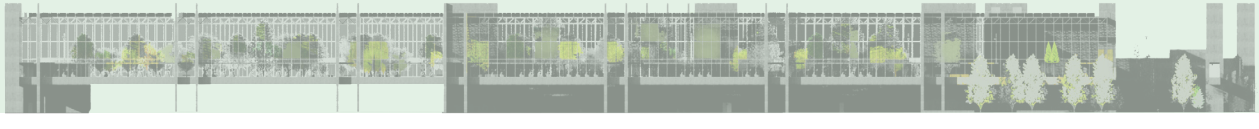
THE BASSETT CREEK PEDAL CLUB



INTRAMURAL CYCLING ENVIRONMENT

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THE BASSETT CREEK PEDAL CLUB

A DESIGN THESIS SUBMITTED TO THE
DEPARTMENT OF ARCHITECTURE & LANDSCAPE ARCHITECTURE OF
NORTH DAKOTA STATE UNIVERSITY

BY

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IN PARTIAL FULFILLMENT OF REQUIREMENTS
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MASTER OF ARCHITECTURE

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THESIS COMMITTEE CHAIR

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FARGO, ND

THE ABSTRACT

Understanding a specific need of the public is very important when looking at how a building can promote a healthy lifestyle, while saving energy and bringing a community closer together. Minneapolis, Minnesota, along with having some of the most extreme weather conditions in the world, lacks a solution for the harsh winter months for bicyclists. This thesis takes a close look at providing the Minneapolis metro area community with an intramural cycling environment that's able to be used year-round. Intramural Cycling Environment includes but is not limited to the specific design of the Bassett Creek Pedal Club, which is a new type of hybrid typology for an indoor recreational environment. The complete square footage of the project is approximately 334,000 s.f.

keywords
bicycle
community
energy
health
wellness
minneapolis
environment

PROBLEM STATEMENT

How can architecture promote a healthy lifestyle while saving energy and bring a community closer together?

TYPOLOGY
Indoor/Outdoor Biking Facility

CLAIM
Teaching the community about the awareness of the environment and saving energy while promoting a fun and rewarding activity. Focus to provide the client who will use the building year-round access to an activity that Minnesotans can only enjoy for a few months out of the year. The bicycle facility is located specifically to increase the use of bicycles in Minneapolis, as one of the top bicycle community in the country.

ACTORS
bicyclists
community

ACTION
Supply a structure that provides a solution for year-round biking.

OBJECT
An indoor and outdoor bicycle facility with multiple functions and uses.

HOW
For the summer months the building would be an open facility, similar to being outside. The main focus would be the winter months where people could come use their bicycles and enjoy an atmosphere similar to the summer months with lush green trees and plenty of natural sunlight.

UNIFYING IDEA
If architecture can help the environment while providing an opportunity to promote an overall better well-being then it is a practice that should be implemented.

SITE
Minneapolis, Minnesota

PROJECT JUSTIFICATION
We are becoming less and less aware at the rising problems with obesity in our country, architecture can help in a way that provides a location for people to come and enjoy a common interest such a biking while helping the environment and local community. Minneapolis is in need of a building that provides a solution for bicyclists during the winter and a great place that people can enjoy all year. The facility would be mostly used by your typical biking athlete and road bicyclist. The person who is looking for somewhere to enhance their training and cycling skills would benefit most from the facility. People all ages would be welcomed facility and that is the point to simply raise awareness of obesity and saving energy by biking. The building would be a great location for people who do not want to pay for parking downtown and simply drive to the facility and bike to work.

NARRATIVE

Being active and outgoing is a key aspect in creating a community. Sometimes the hardest thing to do is someone's favorite thing to do. It is important to keep your friends and family close and including them on your regular activities brings enjoyment to your life. Growing up in Minneapolis I was immediately submersed in the ease of access Minneapolis allows bikers to have throughout the culturally rich and diverse city.

The Bassett Creek Valley area just less than 1 mile west of downtown includes trails, parks, railroads, streets and a river all connecting to the heart of downtown. It is a great area to meet with people to walk into downtown, close to the lakes and a central hub for the grand rounds urban path development that connects most of the city with its suburbs. A short walk to the walker art center or a quick bike ride to the Twins Stadium, the Bassett Creek Valley area is a beautiful place to walk around or even just sit and look at the Minneapolis skyline. This boundary where the city ends and nature has a chance to spread out and the bike paths, similar to veins of the body, feed the city with youth and energy.

I have been fortunate to have grown up in such a great city that is trying to work with communities by having developed so many options for transportation into the city besides driving a personal vehicle. I remember being younger and the city started constructing a bike path 2 blocks from my house and I was only allowed to go to where the bike path ended. Every day that passed I would bike to the end of the path and stopped where the pavement met the dirt and seeing the Minneapolis skyline through the trees and how far it seemed to me.

As I grew older so did the path, longer and longer the trail stretched until one day when I started my college career at Dunwoody college of technology I tried biking to class and noticing that the bike path just kept going and before I knew it in just a few short miles, I had reached the parking lot of Dunwoody riding on the path that is called the Cedar Lake Trail Greenway.

A bicycle is one of the cheapest and most economically efficient ways to travel, the impact of biking in the community has been so explosive over the past few years in Minneapolis and with only a few months out of the entire year that really allows for biking comfortable, something for biking indoors is becoming a necessity by the day. For many people as soon as the first snowfall occurs in Minnesota and much of the rest of the world, the bike is put back in the garage forgotten about until spring. For me biking is such a great way to be a part of something that is completely your own, you can ride at your own pace and engage your whole body and mind.

CLIENT DESCRIPTION

OWNER

Locally owned and operated by the Minneapolis public works department or by a private investor, potentially owned by a local company that supports biking and the community.

MEMBERS

The occupants would be local residents who have joined the club and are registered to use that facility.

EMPLOYEES

Instructors and teachers to help run the facility and help with daily activities. There will be janitorial staff and people to run the shop/maintenance center. the typical hours of operation would be 6:00am to about 10:00pm in the evening. Occasionally a starlight ride where lights are turned down and people can enjoy a night ride after close. Peak hours would be in the morning before work from 6:00am - 8:00am and after work from about 5:00pm - 7:00pm.

Bike Track

Outdoor Mountain Bike 'Off-Road' Course

Spinning Rooms

Bike-Customization area

Nice-Ride Station

Bike Shop & Maintenance / Repair Area

Bike Storage

Mens/Women Lockers

Offices

Event/Conference Space

Coffee Shop/Juice Bar

Children Play Area / Day Care

Bus stop

Light Rail Transit Station

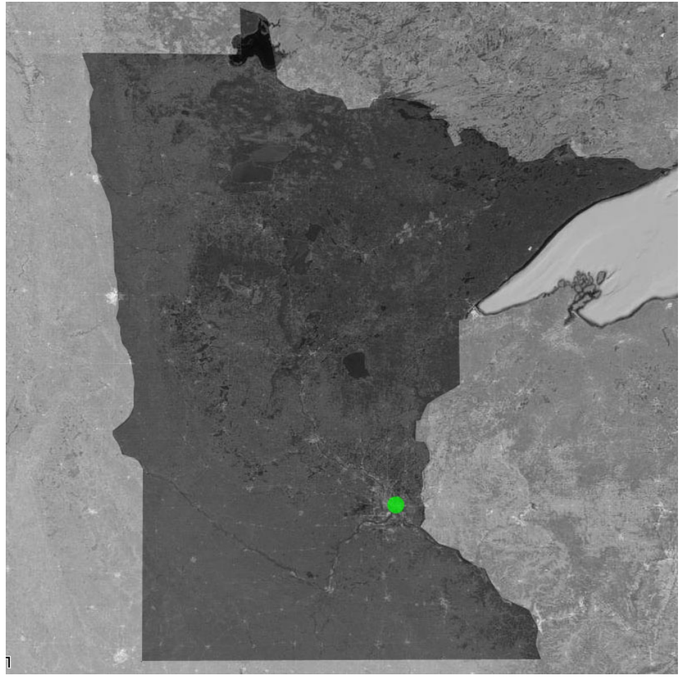


FIGURE 1
Map of Minnesota
by Google Maps
(http://www.maps.google.com)

LOCATION
Linden Yard West, Minneapolis, MN

Latitude	Longitude
44.97	-93.29

REGION

Minneapolis is abundant with waterways roads and is known for one of the most diverse cities in the Midwest. Much of the Twin Cities is connected with a collection of bike paths known as the Grand Rounds National Scenic Byway which draws a lot of people to the area. The 16th largest city in the nation, Minneapolis has a population of about 400,000 people.

FIGURE 2
Map of Minneapolis, Minnesota
by Google Maps
(http://www.maps.google.com)

THESIS SITE

The site, specifically Linden Yard West, serves as construction storage for the Minneapolis public works department and is occupied by the Burlington Northern Railroad Company. This site is specifically important because it is a wonderful site for this particular function. It connects all bike paths in a central location. Currently, it is not used for what should be a beautiful welcome to the city landmark when people drive from the west into downtown they are confronted to a beautiful building instead of a big 4 story dirt hill. The site is large enough to host any sort of functions with plenty of space for multiple uses or one large building for a specific purpose.

FIGURE 3
Map of Linden Yard West
by Google Maps
(http://www.maps.google.com)

PROJECT EMPHASIS

In an attempt to bring the community closer together, the search for what the city needs is most important. Something that is necessary is something that is interesting that keeps people active, informed and happy. Can a building do achieve such great aspirations? This approach is specific in searching for an influence on society and happiness while suggesting clean energy with net-zero building technologies.

A PLAN FOR PROCEEDING

Research Direction

Understanding why no one has really done this design strategy in the past will be part of a difficult process in the research portion on this documentation. Research will take place throughout the entire project duration along with several case studies that will influence the program outcomes overtime. Realizing that the location and site of the architecture is owned and operated by the city of Minneapolis, the challenge to see what can be done to alter the site or a possible relocation will be researched as well. Areas that will be covered will be typological studies, historical context, site analysis and programmatic requirements and spacial allocation.

Design Methodology

The direct form of research in design methodology will be the mixed method approach which includes but not limited to quantitative and qualitative research. This will be conducted using the latest tools available along with interviews, archival search and local surveys.

Design Process & Documentation

During research there will be a process with which will be followed according to what is needed and required for that time. Drawings, Site studies (video, audio etc.), Photographs and Site analysis diagrams will be some of the documentation used to show examples of progress.

1	Conceptual Analysis	35 days Mon 12/9/13 Fri 1/24/14
2	Spatial Analysis	12 days Wed 1/1/14 Thu 1/16/14
3	Project Documentation	27 days Mon 1/13/14 Tue 2/18/14
4	Structural Redevelopment	14 days Mon 1/20/14 Thu 2/6/14
5	Materials Development	5 days Mon 1/20/14 Fri 1/24/14
6	Envelope Development	16 days Mon 1/27/14 Mon 2/17/14
7	ECS Passive Analysis	19 days Tue 2/11/14 Fri 3/7/14
8	Context Redevelopment	2 days Tue 2/11/14 Wed 2/12/14
9	ECS Active Analysis	11 days Mon 2/17/14 Mon 3/3/14
10	Context Analysis	3 days Mon 2/17/14 Wed 2/19/14
11	Section Development	7 days Mon 3/3/14 Tue 3/11/14
12	Midterm Reviews	5 days Mon 3/10/14 Fri 3/14/14
13	Project Revisions	5 days Mon 3/24/14 Fri 3/28/14
14	Preparation for Presentations	5 days Mon 3/31/14 Fri 4/4/14
15	Presentation Layout	4 days Tue 4/1/14 Fri 4/4/14
16	Plotting and Model Building	14 days Mon 4/7/14 Thu 4/24/14
17	Exhibits Installed on the 5th Floor	1 day Mon 4/21/14 Mon 4/21/14
18	Thesis Exhibit	3 days Mon 4/21/14 Wed 4/23/14
19	Final Thesis Reviews	6 days Thu 4/24/14 Thu 5/1/14
20	Commencement	1 day Sun 5/4/14 Sun 5/4/14
21	CD Due to Thesis Advisors	0 days Wed 5/7/14
22	Final Thesis Document Due	0 days Fri 5/9/14

TABLE 1
The Schedule
by Casey Cotcamp

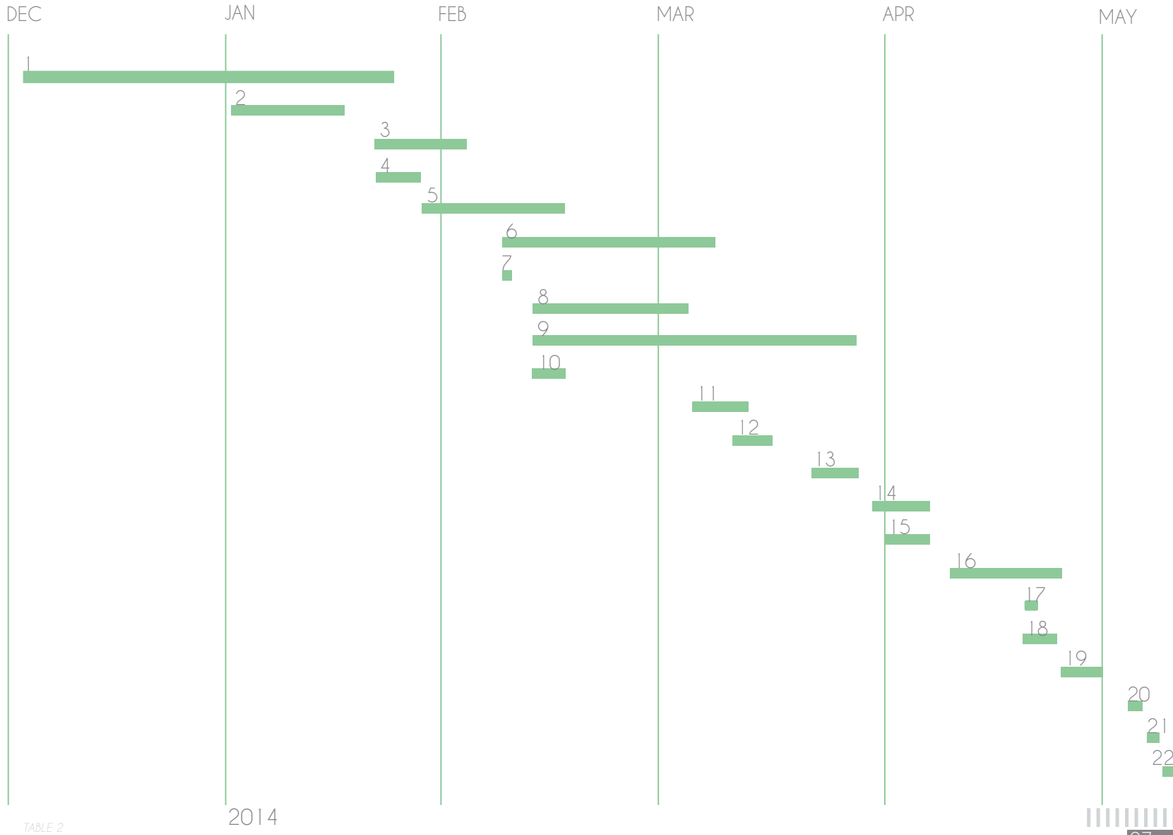


TABLE 2
Time Table
by Casey Catcamp

ARCH 271 DESIGN STUDIO I - FALL 2010
PROJECTS
TEA HOUSE
BOAT HOUSE
JOAN VORDERBRUGGEN

ARCH 272 DESIGN STUDIO II - SPRING 2011
PROJECTS
DWELLING
MONTESSORI SCHOOL
DARRYL BOOKER

ARCH 371 DESIGN STUDIO III - FALL 2011
PROJECTS
ZOMBIE SAFE HOUSE COMPETITION - ZSHC
ARTIST-IN RESIDENCE
REGIN SCHWAEN

ARCH 372 DESIGN STUDIO IV - SPRING 2012
PROJECTS
NDSU SCIENCE & ENGINEERING BUILDING
MIKE CHRISTENSON

ARCH 471 DESIGN STUDIO V - FALL 2012
PROJECTS
HIGH RISE
LIGHT/DARK COMPETITION - KKE
CINDY URNESS

ARCH 472 DESIGN STUDIO VI - SPRING 2013
PROJECTS
GHANA CAMPUS DESIGN & DEVELOPMENT
WINDOW DESIGN COMPETITION - MARVIN WINDOWS
DON FAULKNER

ARCH 771 ADVANCED ARCHITECTURAL DESIGN - FALL 2013
PROJECTS
AFFORDABLE HOUSING DEVELOPMENT - reGEN BOSTON
REGIN SCHWAEN

ARCH 772 DESIGN THESIS - SPRING 2014
PROJECTS
INTRAMURAL CYCLING ENVIRONMENT
GANAPATHY MAHALINGAM

The human body is a seriously complex and underrated organism. Containing over 100 trillion cells which together completely form the human body; we strive daily to treat ourselves with quality and respect. We have designed our lifestyles to fit our bodies, everything man made is carefully constructed ergonomically to suite our bodies. Much like a fully functional building, our bodies are comprised of various systems that complete the process of life and keep us alive.

Eating right and staying active are key essentials in living a long and healthy life, so why not treat our bodies right? Society and the media leads us in a fog when they tells us what beauty is supposed to look like in a body and how we should live our lives, what to wear, how much to weigh and what to eat. "Our world today is surrounded by and infused with an overabundance of media imagery that diffuses any sense of local culture or place. Detached from natural phenomena, we struggle to find some understanding of the relationship between body and built form" (Crisp, 1998). We are clouded at the thought that we all must be models and once we are too overweight we cannot enjoy life simply because we don't know how or everything seems too difficult. Many people stop enjoying the outdoors and are ashamed of their bodies all the way to the point where they lose their closest friends and families because they have lost control of their eating habits. Some people can even be so stubborn that they get bored with daily workout routines so they simply stop doing basic healthy activities and use technology to fill their time. "Lack of time that can be disposed by individuals for their own use such as leisure is particularly pitiful among urban residents" (Nagashima, 1995).

Psychologists have proven that social gatherings and staying in touch with the world guides humans to a healthy lifestyle, so why not create something that can be fun for people to use while bringing people and their communities closer together while exercising and using all the latest forms of technology, because no one wants to be left out of the loop.

"…The environment is the basis for manifesting an architecture that privileges the person and is body centered rather than place or object specific" (Crisp, 1998). When designing architecture we must think about the holistic approach to design and how all the systems of the building can function together, creating a truly beautiful and comfortable space to enjoy. The importance of space in architecture can reflect on how a building is used. In this instance of architecture the form must truly follow function, keeping a minimalist approach to design will help keep the space in the building used for its intended purpose and not lost because of excessive open layouts.

"Fitness is the most popular indoor physical activity today. In response to a recent survey, 47.2 percent, or 97.8 million, Americans report regularly visiting a fitness club or exercising at least three times a week…The essence of a fitness facility is human energy. Communicating that energy is youth, or "hard bodies," suggests a transparency exercise floor of the facility" (Diedrich, 2005). Space is very important for people; it will be the most prominent aspect to this facility. When people come to use the facility they want to know that there is enough open space, they want to feel comfortable and be able to embrace the common ideas of each other and their lifestyle.

A place to interact with people after working long hours at their regular day-to-day job that is in enjoyable for individuals and families is important for the community. Simply to make people smile and shine light into a space when people are so used to staring at their dark, stale cubical walls all day. It is important to me as a designer to find a solution for something so unappealing that almost makes me upset to think about, the fact that people actually live that way. To create a space that solves this problem for the community to change peoples' lives for the better is very important for this thesis.

"People not only work long hours but are also obliged to spend long hours commuting. This leaves them a very limited for sports or other types of recreational activities" (Nagashima, 1995). During the common workday, people mostly tend to sit and stare at computers, blinding them to the harm that is being influenced on their bodies. Before or after work it is important to find something that a person can do that gets their mind off their daily maybe not so fun or even mundane work environment. It is important to keep a mind of the outside, to simply understand and consider there is life outside the workplace walls and look forward to doing something important to the common health and well-being. "Our global culture is fast becoming conscious of and dedicated to facets of our overall health and wellness – mental, physical, emotional, and spiritual. Our built environments are no exception. It has become increasingly evident that environments influence our behavior and shape our actions." (Crisp, 1998)

The bicycle itself is a release, a simply idea yet complex mechanically that has created an escape for many people. Alone on the road, open to the environment there is no speed limit, allowed to go as fast as possible want or as slow as you want.

Feeling good and expressing emotions completely focusing on the bike. You have to keep hands active and treat ever pedal you make carefully with a watchful eye on the road ahead. The importance of nature and what it means to bike has lead people to how important it actually is to use the common bicycle.

The actual importance of biking means taking the time, even though it may be longer, to slow down and absorb detail in the surroundings. The simple pleasure of feeling each rock or split in the pavement, feeling the cars rush by on your left, watching the clouds roll in to just feel the start of a slight drizzle from the unpredictable weather are all absolutely enjoyable characteristics of using the bicycle. "I felt more connected to the life on the streets than I would have inside a car or in some form of public transport; I could stop whenever I wanted to; it was often (very often)." (Byrne, 2010) Something interesting to think about is how life would be different if cars were completely obsolete and new forms of bicycles were forced to take place and people enjoyed using their bicycles with friends and other people. Being more connected to the physical reality of life is one of the most important goals of this thesis. Can people embrace the future of technology while also finding time and enjoyment with something so beneficial and 'free' or simple such as biking?

The relationship between the biker and the road is one of the most important pieces to this research. The road or path physically is typically straight, we find more and more roads in the city today adapting to the bicycle boom in many cultures around us. Are the bicycle and its experience more about getting from point A or point B or is it more about the experience in between?

The path the bicyclist endures on a casual riding day can be very different than the daily commute to the office; even though the paths are generally the same; each biker has different motives and different goals on that bike path. We must find acceptance in the fact that people typically enjoy a smooth path with fewer obstructions that calculate into a calm and satisfying bike ride. The daily commuter bicyclist is fast and straight with a focused stare and an 'I have long day at work' attitude to keep them diligent on their ride.

The casual rider on a paved path through the park typically weaves back and forth, enjoying the breeze with sometimes a brief encounter with the grass on either side. Both types of bicyclists are benefiting on what that city has provided them with: a simple, easily-maintained bike path for those who may have not even asked for it. Whether it's biking through tall grass in the field on a path that only few have ridden or through a busy downtown city with a typical 'off the curb' bike lane, using the bike can be a very fun activity.

Sense of space is what attribute is the most important to the bike, the landmarks and the trees, able to see everything. The sky is visible once again. Closer to nature than ever before, working with every breath perfectly with every pedal, the path weaves over railroad crossings, down the steepest hills, through the biggest parks, under the busiest roads and next to the loudest trains. All of these things are ways in which the city has squeezed the experience of biking into the heart of the community. "This point of view-faster than a walk, slower than a train, often slightly higher than a person-became my panoramic window on much of the world…It's a big window and it looks out on a mainly urban landscape. Through this window I catch glimpses of the mind of my fellow man, as expressed in the cities he lives in" (Byrne, 2010).

On the path there are no individual experiences, the moment you start biking the experience starts the ride itself and everything connected to it is the story. We must find the encompassing enjoyment in even the negatives of the ride. To be part of the road out with nature while helping the environment is one of life's great pleasures and more people should realize and embrace this ever growing lifestyle.

One thing to keep in mind about riding a bicycle as a lifestyle is that with such a great independent responsibility comes such a great fear. A bicycle isn't much bigger than a person and with the speed that a cyclist can travel at it is very important to remember to always stay on a keen alert when biking anywhere. It can be a very different experience when riding in a downtown area compared to riding on a path through the forest. When a person heads down the stairs of their loft downtown in the morning and unlocks their bike from the rack, an immediate sensory perception takes over. You grab you bike, face it in the direction you want to go and start pedaling away. Your mind starts working faster and your eyes start to constantly jump around trying to focus on anything that might get in the way. Your ears are listening to any approaching cars and you grip your hands tightly around the handlebars and you brace yourself for any uneven path you may encounter or any debris or pedestrian that may get in your way.

Being seen or noticed is the greatest importance when riding a bicycle through the city and sometimes that can be the greatest fear. Worried when crossing your first intersection you may be going to faster or not fast enough and an approaching car may not see you and then you end up in the hospital.

We cannot let fear take control of the handle bars; we must enjoy riding outside in the busiest of streets and embrace the feeling of the wind and sunlight shining down.

Riding in a car can be convenient and nice for driving long distances and even in the winter nice for driving to the market but since the early 1900s nothing really compares to riding a bicycle. "The bicycle ranks right up there with the automobile, the sneaker, and the guitar as a ubiquitous cultural symbol. It's one of those things that are part of all of our lives at one time or another." (Weiss, 2010) Traffic is one of the main reasons people refuse to ride a bicycle. It's not because it's hard or that it is no necessary but simple the idea of sharing the road with something that can kill you.

Cars out number, out power and easily outweigh people and if that's not enough to scare someone the simple fact that people can be distracted easily by cell phones, stereos, food or anything else that takes attention away from driving is what really 'drives people off the road'. What the scariest thing to think about is that there are actually people driving around out there that hate people on bikes and will do everything in their power to scare you, they will rev their engines up as they past, maybe splash a puddle on you on purpose and some even swerve into you on purpose just to make you shake. Fear is very powerful when riding a bike but once you ride more often and really enjoy the feeling of being outside, riding is one of the most enjoying activities someone can do.

Everyone finds different activities to get them through the day and meditation practices have been a common use for people for thousands of years. The world is very diverse when it comes to natural medicine practices ranging from massages every day, like many people in Japan do for stress relief, to a energizing sprint in the middle of the winter here in the Midwest, everyone find their own enjoyment in different activities.

One thing that is common for everyone is the awareness of breathing, realize how good it actually feels to breath and while you breathe in the goodness of fresh air the bad air is going out. Breathing and riding a bike work together naturally, exerting force through applied movement and you start to feel the reward from the bicycle. Riding this bike and using your body, unconcerned with time, starting to create the feeling of enjoyment that this moment is encountering. There are not enough places to do this in Minneapolis especially in the harsh winter months.

It is important to create architecture that has solutions for self-medication and spaces for medication. The bicycle is the medication and architecture is the solution, the creation of a space that people can relax and enjoy their favorite activity year round. A place with trees, open spaces, group gatherings and learning is most important for the creation of a space that solves a solution for the city of Minneapolis.

A carefully fine-tuned relationship, the human body is one with the bicycle. A breathing intricate system of moving parts and the bike needs the body to become a functional device. If thought about carefully, the bike is a very complex piece of equipment that needs to be taken care of, similar to how a person takes care of their body. A healthy lifestyle is very important for the well-being of humans and an activity like riding a bicycle can relieve stress, lower blood pressure and help us to stay active. People get lost in the chaos of the media and forget how easy it is to just leave work every day and sit on the couch to watch TV.

We forget about life is like outside and how great it can feel to breathe fresh air and feel the wind blow. “Our world today is surrounded by and infused with an overabundance of media imagery that diffuses any sense of local culture or place. Detached from natural phenomena, we struggle to find some understanding of the relationship between body and built form” (Crisp, 1998).

Understanding how easy is to get lost in the technology and how convenient it is to sit on our phones all day, browsing the internet to find some other new article stating how obese our country is, we must remember to get outside and enjoy the company of other people. It can be difficult in the middle of winter to find ambition to get outside and go do something and riding a bicycle in the winter is even more out of the question for much of the population in Minneapolis.

If there was an indoor facility where people could go to get out of the cold harsh winters and enjoy nature and the community while staying active and helping the environment many people would look to that solution.

The moment we leave our location and start riding the bicycle it is not always about where the location is or how long it will take to get there, it is more importantly about the path we take in between. We must remember that the path is the story, what happens on the path during the ride is more important than anything else in the world. Sitting a little higher than a car, people on bicycles have a different view of the world.

A person walking down the sidewalk has a completely different experience than someone riding a bike on the same sidewalk. The speed, the obstacles and even other bicycles or cars are all factors that differ in cautiousness from a biker to a person. The path is very important to a person on a bicycle; it is just as important as the bike itself. Depending on goals set by the rider, the path must be as well maintained as the persons bike, whether it be a skinny dirt path through the woods or a wide black top lane through downtown, the path must be to the liking of the biker. Riding on your favorite path with the sun shining down, or feeling a little drizzle from the clouds rolling in there is nothing really similar to that type of feeling.

Many bikers in the community are completely aware of weather conditions outside and some even use nature as their source of stress relieving mediation. Similar to getting a massage or relaxing in a hot tub, the bicycle is an outlet for many people and it provides one of the top forms of natural medicine. “Cycling is a great stress reliever, and can be a great way to unwind after a tough day at work. Cycling will invigorate you and give you additional energy throughout the day. You will get a bump both physically and mentally from cycling and who couldn’t use that once in a while?” (Pease, 2010).

VY GYM LOCATION: AMMAN, JORDAN - AREA: 64,583 S.F. - ARCHITECT: SYMBIOSIS DESIGNS LTD.

The Vy Gym is an interesting case study for me because it's has human scale elements that I find very important but the building itself seems to be designed solely around the running track which is elevated up onto the second floor. If anyone has ever been to a wellness or fitness center before they know that for ease of access and to minimize obstructions designers tend to put exercise track on the second floor for ease of circulation. The building is designed around the largest and most important part of the building which is the track, it does something very unique which is different from other exercise facilities I have seen in the past, the track actually leaves the building and for a little while your body leaves the building and you feel like you are running on air above the rest of the world.

FIGURE 4
Outside Vy Gym, Amman Jordan
by Osman Akutz
(http://www.archdaily.com)

Left - FIGURE 5
The Workspace, Amman Jordan
by Osman Akutz
(http://www.archdaily.com)

Right - FIGURE 6
Corner of Vy Gym, Amman Jordan
by Osman Akutz
(http://www.archdaily.com)

The track cuts through the building exposing activity areas for the runners to observe. It is important to keep a healthy, positive energy building for people to enjoy. These types of facilities should be easily accessible to people of all ages all over the world. "Vy Complex is the largest, most comprehensive and most progressive sport facility in the Middle East. Conceptually the spaces and their configuration build up on the notion of energy and well-being, enforced through several internal dynamics such as exchange of natural light and scenography with visual connections, many of which reveal kinetic movements." (Symbiosis Design) In the interior of the building the colors are mild and natural to the materials. Fitness facilities seem to revolve around a mixture of industrial and minimalist design, what is essential to the function is kept while less time is spent on ceiling patterns or unfamiliar obstructions. For example the Vy Gym is an open concept floor plan with designated rooms for specific activities and most of the facility should be design to focus on human scale.

STRUCTURAL DIAGRAM

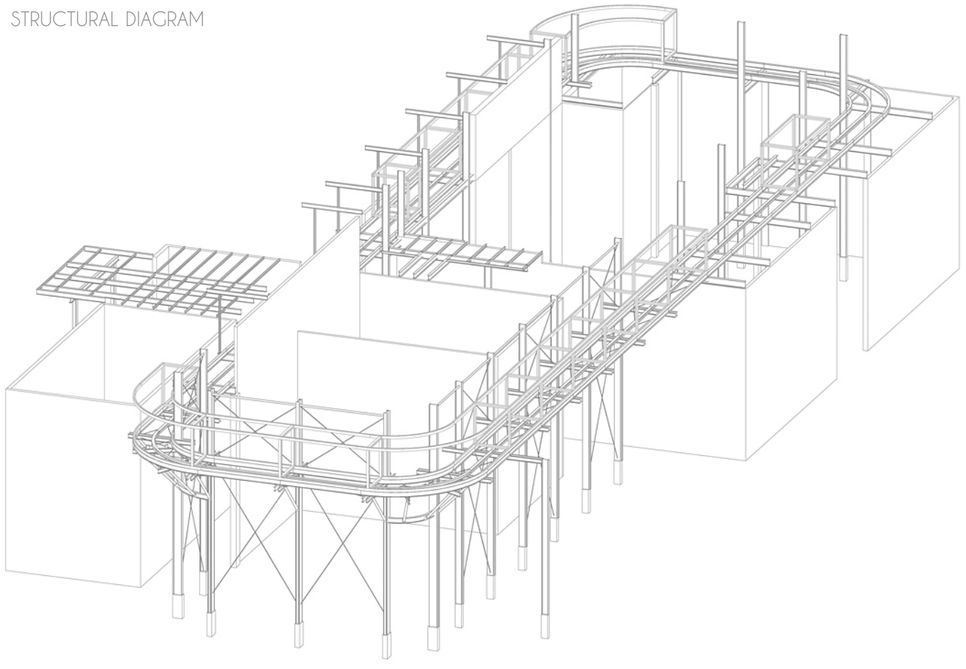


FIGURE 7.
Gym Structural Diagram
by Symbiosis Designs LTD.
(http://www.archdaily.com)

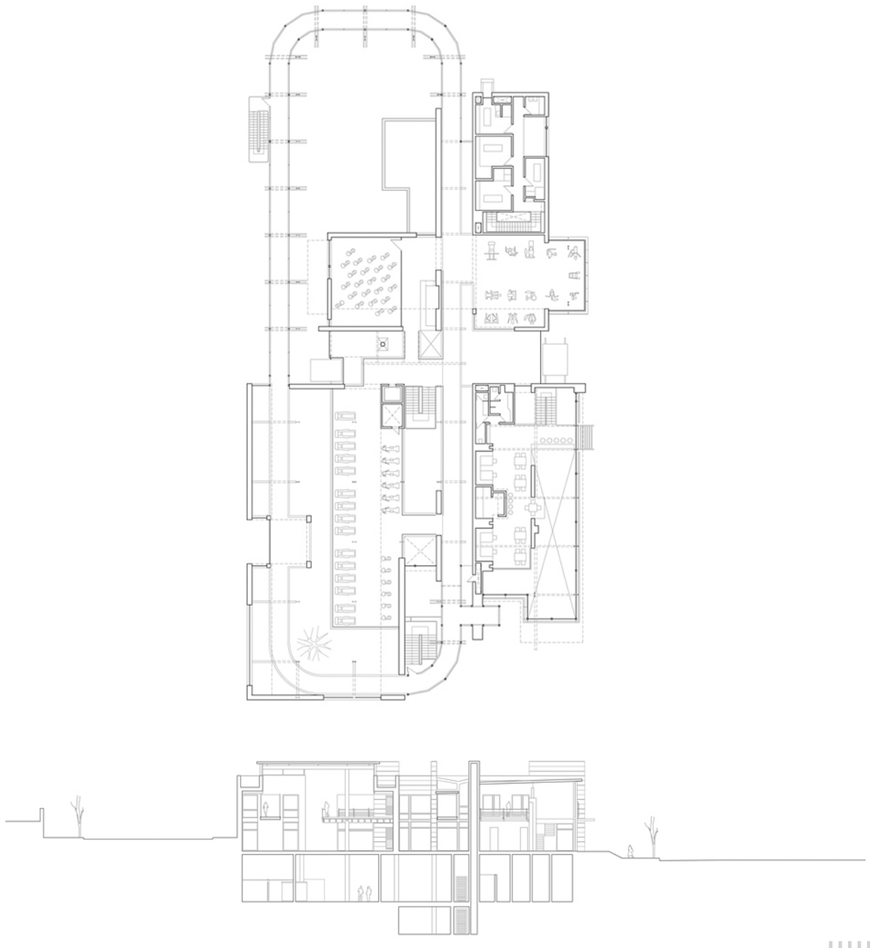


FIGURE 8.
Gym Plan VS. Section
by Symbiosis Designs LTD.
(http://www.archdaily.com)

PLAN - SECTION RELATIONSHIP

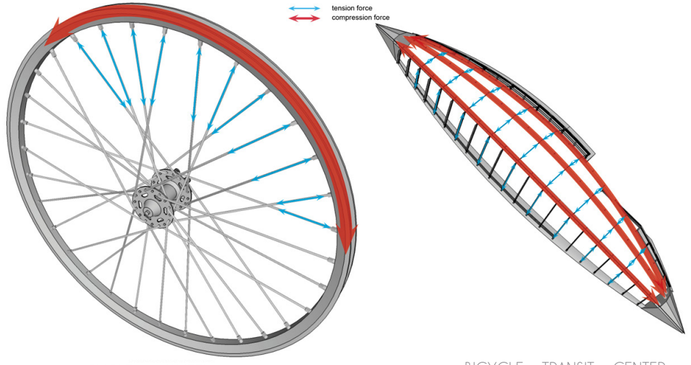
UNION BIKE STATION

LOCATION: WASHINGTON D.C. - AREA: 1,750 S.F. - ARCHITECT: KGP DESIGN

The Union bike station in Washington D.C. is a very unique moment of architecture. Only able to hold a few people at a time it is a wonderful solution to an enclosed bicycle shelter, safe from wind and rain or snow you are able to store your bike here and perform basic maintenance out of the way of nature's elements. The form of the structure as you can see in the diagram shown is a conceptual idea of a rim from a bicycle. The strange relationship between the actual train station and the bike structure is interesting and do not correlate directly to each other, each form has its own purposes different from each other and each building was designed specifically for the function within the structure. The metal frame with glass façade reminds people of the lightweight frame that comes from bicycles and strong steel to hold the weight.

FIGURE 9
Union Bike Station
by KGP Design
(http://www.archdaily.com)

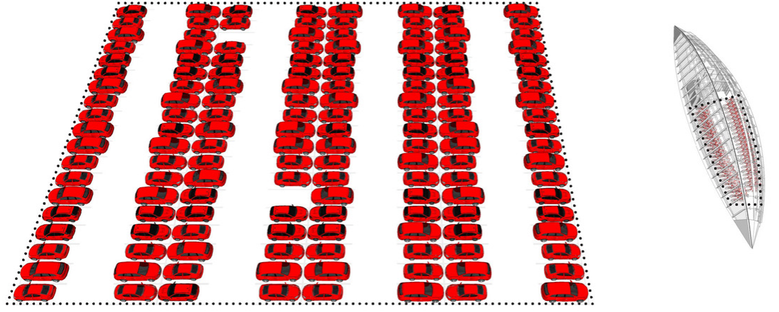
AXIAL LOADING DIAGRAM



CYCLE WHEEL

BICYCLE TRANSIT CENTER

PARKING SPACES REQUIRED FOR 150 AUTOMOBILES VS. 150 BICYCLES

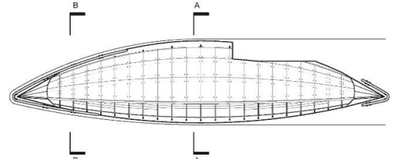


45,000 S.F.

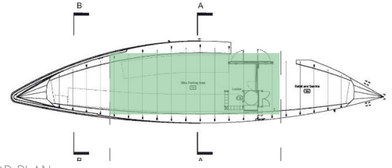
1,000 S.F.

Top - FIGURE 10
Influence Model
by KGP Design
(http://www.archdaily.com)

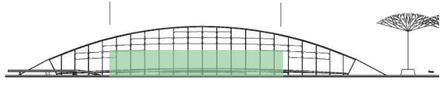
Bottom - FIGURE 11
Bikes VS. Cars
by KGP Design
(http://www.archdaily.com)



ROOF PLAN



GROUND FLOOR PLAN



WEST ELEVATION

EAST ELEVATION

FIGURE 12

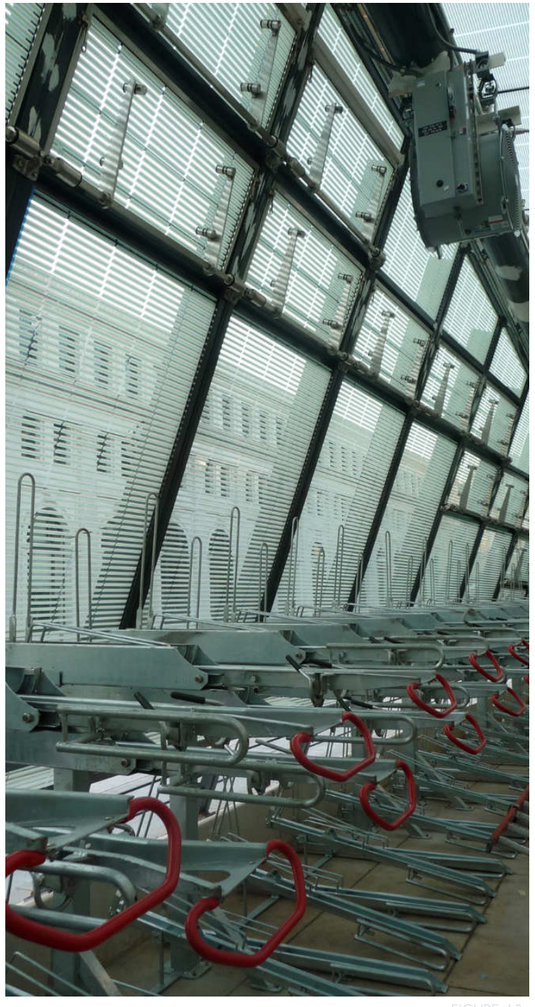
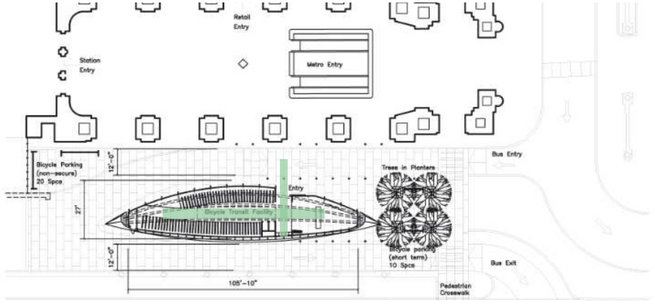


FIGURE 13

Left - FIGURE 12
Union Plans & Elevations
by KGP Design
(http://www.archdaily.com)

Right - FIGURE 13
Inside the Station
by KGP Design
(http://www.archdaily.com)

SITE CONTEXT & BUILDING RELATIONSHIP

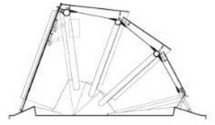


The space itself is only about 1,750 square feet which does not seem like a lot but the amount of bikes this can hold compared to the amount of space a parking lot can hold it just makes so much more sense to use a bicycle to save space and live a healthier life. Bigger cities are starting to realize how important it is to provide places like the bike station for people who come to cities hoping for a nice easy commute to work or just accessible places to keep their bikes when riding from place to place. Similar to a bicycle, this structure relies on all elements to stand-up.

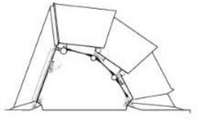
Without the ties rods or metal tubes the shelter would collapse and cease to exist. Same with weather conditions, if something as simple as the glass were to disappear the entire focus of the structure would be lost and no one would use it if its function was lost. "At the cusp of a livable cities movement, this facility is a highly visible catalyst promoting bicycle use and alternative transportation options by providing secure parking, rental, and retail uses. At the doorstep of Washington's major transportation hub, Union Station, the sleek veiled form reflects the technology of its contents while complimenting its eminent Beaux Art neighbors." (KGP Design)

It would be interesting if a building could be designed as a sort of 'headquarters' where people can meet up, then you have several of these structures around to relate back to the overall idea of the relationship of biking in the city.

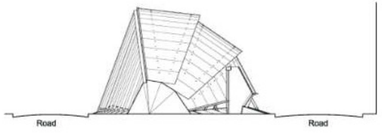
STRUCTURAL DIAGRAMS



SECTION A



SECTION B



SOUTH ELEVATION

Top - FIGURE 14
Union Site Plan
by KGP Design
(http://www.archdaily.com)

Right - FIGURE 15
Union Sections
by KGP Design
(http://www.archdaily.com)

BICYCLE CLUB LOCATION: HAINAN, CHINA - NL ARCHITECTS

The Bicycle club in Hainan is special from anything I have seen before, an open air, double story, free to the public velodrome that can keep people entertained for hours. The lobby on the lower level is comprised of lightweight columns that keep the space open and free flowing so people can ride their bike leisurely below the busy track. The lower level also has a lounge area and small convenience bar that people can sit and enjoy the nice weather at the resort. This concept sits at the base of a resort and many people in this area do not really bike and this will help the community use be more active and try something so unique that could be quite fun. Once again this structure is designed around the concept of biking, form follows function in this ideally straight forward simple design.

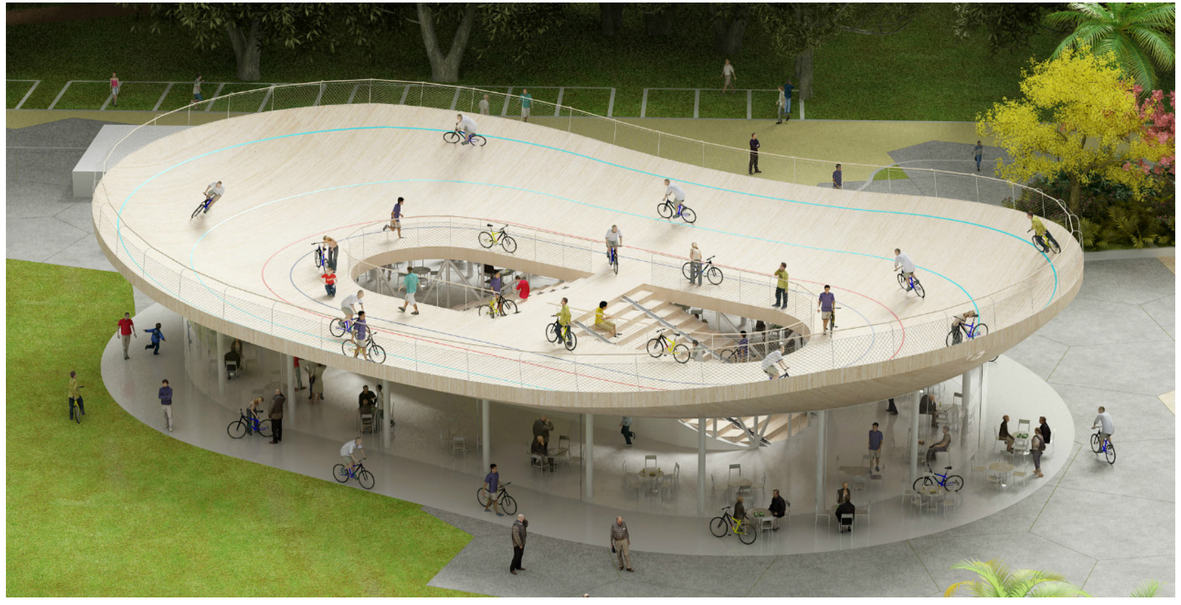
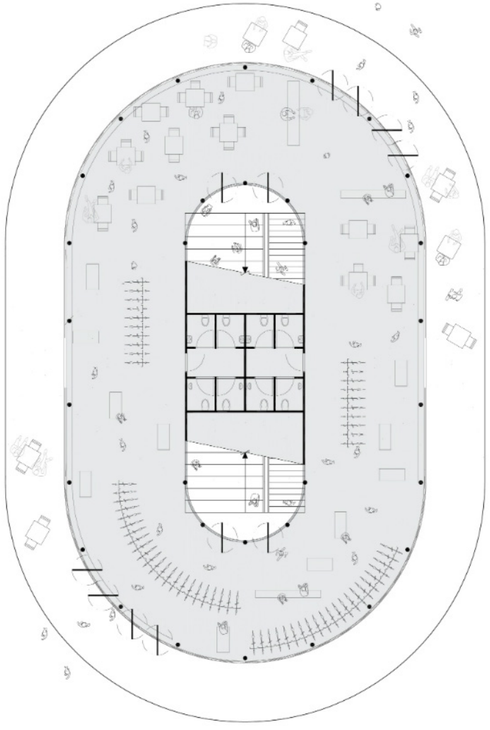


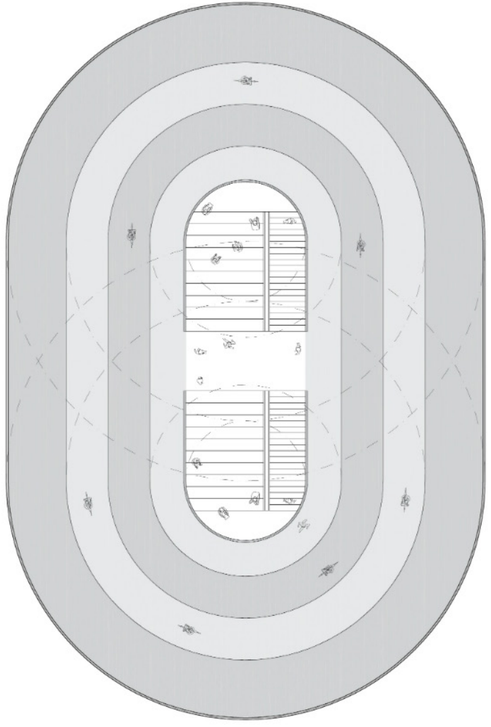
FIGURE 16
Concept Bike Club
by NL Architects
(http://www.archdaily.com)

"Visitors can rent a bike and join the fun in the open-air velodrome or simply visit the club's cafe and be entertained while sitting on the large staircases found in the middle of the oval structure." (NL Architects) Construction of these should take place more often in busy areas in America. It is important to stay active and have something to look forward outside of work that maybe people can even see from their high rise window that keeps their mind looking forward to something after work. In climates similar to Minneapolis it would be essential to enclose these structures to protect from the harsh winters or rain so people could still use them all year round.

FIGURE 17
Inside the Concept Bike Club
by NL Architects
(http://www.archdaily.com)



GROUND FLOOR PLAN



UPPER FLOOR PLAN

FIGURE 18
Bike Club Floor Plans
by NL Architects
(http://www.archdaily.com)

SECTION & STRUCTURAL DIAGRAM

FIGURE 19
Section & Structural Diagram
by NL Architects
(http://www.archdaily.com)

TYPOLOGICAL STUDIES - SUMMARY

Researching existing architecture is essential to the development of future design and must be carefully examined to fully understand the quality of experience within the typology. The closest typology my project can relate to is the typology of wellness centers and any sort of bicycle structure. Since the project I am developing has yet to make an appearance in the real world, finding case studies can be daunting and difficult. The approach I have taken is to find certain aspects of each case study that offers a spark of design creativity I could potentially use to help further develop my project. The union station bike structure is an small project that can be placed anywhere in the world. Paying close attention to detail, the glass construction has been carefully designed to allow the viewing of the environment around looking out, but also allowing people to see in to see how busy the space is. Modeled directly after the rim of a bicycle, the form implies speed and a lightweight structure similar to the components of a bicycle.

The Vy Gym, in Amman Jordan, is the largest wellness center in all of the Middle East and features a running track that actually leaves the building and has an experience similar to running outside. What I like most of all about this design is the open floor plan and its cohesive design which makes the rooms flow together nicely. The interior is modest and clean, with industrial and modern design techniques, it really focuses on the human scale with careful detail to how the space is laid out. What I have noticed looking at several case studies, real world experiences and this particular case study is that most places elevate their track to allow for free-flowing circulation on the first floor and let the track be unobstructed by people walking in the way. What is especially interesting about this case study is that the program of the facility is designed around the track, it cuts through the building and runners can observe activities going on while using the track.

The final case study I have found that qualified for a careful typological research examination was the Bicycle club in Hainan, China. Located on the ground of a resort, it is a lounge and area for free riding on the lower level and a velodrome type design on the upper level. People can rent bicycles and take it to the structure and enjoy a fun bike track with friends. In such a small space it offers a free riding area outside, coffee bar on the lower level with a lounge along with plenty of spaces for people to watch the bikers ride by. What is important about this case study is the solution that has been developed for the space available. Every space has been accounted for and has a purpose which is something to keep in mind when designing spaces that house a lot of people.

There are plenty of wellness centers to discover and many different facilities with many solutions to solve design problems and these were what, in my opinion, qualified as a few of the best that were available to me. There were some studies that lead me to come to these case studies stated earlier. The Student Wellness & Recreation Center at Georgia College & State University was a situational case study where I started looking for wellness centers; it is your basic, functional wellness center.

Another case study that I looked into was the Undena Multifunctional Sport & Wellness in Lithuania. This case study was intriguing to me because of the design; it was more of a meditation wellness center located in a forest outside the Anupriškės Village. Architecture never continues to stop evolving, taking what I have learned from these case studies I will help build a new typology and hopefully people will acknowledge it positive footprint for society and use what designs I have developed as a template for the future.

Discovered around 1680 by explorers from France, Minneapolis was first in habituated by the Dakota Sioux. Building up the area around the dates of 1820 through 1825 what really sparked the growth of the area was the nearby Fort Snelling. The tribes were pressed to sell their land due to special circumstances and Minneapolis, Minnesota first became an established city in 1867, this is the first year rail service became available between Minneapolis and Chicago. Transportation in Minneapolis first started with the railroad in 1867 which very rapidly connected the city with many other hubs in the Midwest. The railroad reached Saint Cloud in 1866 and Wilmar in 1869. Heading south to Iowa, the railway eventually reached Owatonna and Austin. Then the connection to the Milwaukee rail service was made through Prairie du Chien, Wisconsin.

In 1875 one of the most iconic forms of transportation took place and can still be seen through remains throughout the city, this was the streetcar system. First with horse drawn cars run by early business man Thomas Lowry (known best for the Lowry tunnel near downtown). When electricity was available 1889 the city had created over 115 miles of the streetcar track system. The arrival of the bus transit system greatly impacted the profit of the streetcars and on June 19, 1954 the last streetcars were shut down and de-constructed for the strap metal.

There is still a small portion of track remaining that the Minnesota Street Car Museum uses to drive passengers between Lake Calhoun and Lake Harriet. The city was named by Minneapolis' first school teacher, Mni, the Dakota name for water and 'polis' the Greek word for city. One of the biggest reasons the city exists today is because its placement on the Mississippi river and the gorge that separates the Minneapolis from its brother city of St. Paul. Growing up around Fort Snelling and Saint Anthony Falls, the city had a remarkable source of energy and this claimed the city to be "The greatest direct-drive water powered center the world had ever seen." (bycitylight.com)

Being the only water fall on the great Mississippi river many settlers took advantage of the power of gravity and used the falls for much of the local industries power. Some business which started the areas economic growth were flour mills, woolen mills, iron works, machine shops, cotton mills, paper mills and even some wood carpentry shops all located near the west bank of the Mississippi.

Around the time of the 1950s Minneapolis started an urban renewal project where the city built about 180-215 new buildings across 2 dozen city blocks. This renewal project destroyed much of the iconic, historical architecture which may have given a very unique character to the city which some think is what the city of Minneapolis lacks today.

With a population of 392,880 the city has about 20 lakes within its boundaries and also including wetlands, creeks, waterfalls and parkways that connect the city through running and using bicycles. One of the first bicycles was developed in France in the 1860s and had a very large wheel in front followed by a small back wheel. Only some of the wealthiest people owned bicycles and you had to be physically fit to take any falls off the high seat.

It wasn't until 1880 when the bikes with equal sized tires that the world is used to today hit the streets and since then the world has never been the same. It wasn't long before bicycles were in Minnesota and somewhere between 1893 and 1897 many people had bicycles and used them to commute to work. Even back then the Minneapolis Tribune was publishing articles telling the community where to ride and what new recommendations they could recommend. Since many roads hadn't been made for bicycle to endure, most were made of stone and rocks which made it unsuitable for bikers, a group of men formed a group called The League of American Wheelmen to petition for better riding conditions.

In the early 1900s for every bike that was purchased, a tag was required to purchase to register the owners bike and in 1903 over 30,000 bicycles were tagged in Minneapolis.

Cycling in Minneapolis has been a popular activity since the latter years of the 1800s. Many people started forming clubs and groups very early including some to gather for racing and competitions. The Minnehaha park bikeway became one of the first dedicated, a mile long cycling path that was built and intended for racing.

What really helped the boom of bicycles in the city was even during the Great Depression people kept building park systems for people to use which people enjoyed using with their bikes. In 1967 the first 100 mile ride, also known as the century ride, took place in Minnesota which led to the famous Minnesota Ironman. After these competitions started taking place more and more people started investing in bicycles and in 1980 the Minnesota Council began creating and selling the Minnesota Bike Atlas which has an in-depth look the bike trails and paths in Minnesota. Many state railroad lines have been abandoned and removed, many of which are becoming paved bicycle paths.

Currently the state has more devoted bike paths than any other state in the U.S. According to Bicycle Magazine, Minneapolis was ranked the #1 bike city in 2010. Since 2007, Minneapolis also ranks #2 in percentages of workforce commuters who use bicycle daily.

A small non-profit group started a Yellow Bike Coalition in Minneapolis in the 1998 which promoted biking unlike anything else the united states had ever seen.

This first major attempt at a bike sharing company relied solely on donated bikes that were given to the coalition from people in the community. The bikes were painted yellow for branding and to try and stop bike theft but in 2000 the group was forced to shut down due to major theft issues and vandalism taken upon by the bikes. In 2010, after many years of testing, a new sharing system has started called NiceRide. It is a kiosk system that riders can swipe their credit card and borrow a bike for as long as needed use to get from one station to another or just simply ride around town. The income helps maintain the bikes and develop new bike paths for the city. NiceRide has been placed all over the city including along the completely continuous system of bike paths which boarder the city called the Grand Round Scenic Byway.

The Ground Rounds Scenic Byway is a circuit bike path that helps the city become a more cohesive community while connecting people with all parts of the area. The byway is a paved trail that allows bikers to have a special relationship with the city that others cannot. With over 50 miles of bike paths the trail passes the downtown riverfront, along the Mississippi river, through the Minnehaha park area, around the chain of lakes, following Theodore Wirth parkway, all the way to the victor memorial and up to the northeast area.

Most of the byway is through beautiful tree covered areas with usually one lane of traffic on either side with large grass boulevards to buffer from cars. Most heavy vehicles are prohibited from travel on these parkways and the speed limit is 25mph for cars to promote running and using bicycles in the city.

One of the most heavily traveled paths is the three path six lane greenway into downtown from the east. This path runs alongside interstate I-394 and through the Bryn Mawr neighborhood and meadows which shares a park with the Bassett Creek Valley.

Bassett Creek is a small stream of water that meanders through 12 miles of city development from Medicine Lake in Plymouth, MN all the way to the Mississippi river. The creek is named after one of the first settlers in Northeast Minneapolis, Joel B. Bassett. Bassett built the first steam powered sawmill in the Midwest.

Starting in about 1880, much of the creek's wetland was used for industrial business and the area began to also grow with residential homes as well. Most of the buildings were built with very deep pilings due to extreme flooding that occurred and many businesses suffered from seasonal water issues. The U.S. Army decided to rectify the situation and in 1992 built a large tunnel that would drain the water easily and stop and future flooding to happen. When I-394 was built in the 1980s the Bryn Mawr area was divided and suffered from much of the valley being taken from the residents to make way for automobiles.

After the abandonment of most of the rail yards in the city, the Linden Yard which is about 25 acres has been converted to the cities concrete crushing facility and it sits between the interstate and Bassett Creek. There have been many discussions with the city to remove or relocate existing functions of this property to different parts of the city. The land could potentially draw many people to the area for residential and commercial purposes.

Changing the ownership of the property to make way for new commercial spaces could have a strong positive impact on the community and have better relationship with the more iconic architecture that exists nearby. Architecture in Minneapolis is very prominent and with so many new things going on in the city it seems like new buildings get constructed every day. Minneapolis has been fortunate enough to have been old enough to have some great classic buildings such as the Basilica of Saint Mary by architect Emmanuel Louis Masqueray or the new modern Guthrie Theatre designed by architect Jean Nouvel each building is a reflection of the cities culture and continues to help invite people to live in such a great city. After only 4 years of being a city Minneapolis constructed their city hall. In 1883 exceeding 3.5 million dollars and taking up 5 city blocks, city hall is over 5 stories tall with its clock tower reaching a massive 365 feet tall.

Minneapolis has done a really nice job keeping important buildings that have been an iconic piece of history in many parts of the city, whether it is a small residential home in south Minneapolis or the giant Grain Belt brew house built in 1891 careful steps have been made to keep the beauty alive. The city of Minneapolis does not preserve everything because it's old, it must reflect cultural, social, economic, religious, architectural or aesthetic heritage. An upwards of 150 properties have been chosen as city landmarks including cottages, mansions, bridges, warehouses and even large commercial blocks.

PROJECT GOALS

Fortunate to have grown up in such a great city, Minneapolis has always been such a great location for cyclists. Learning to ride my first spring was one of the most memorable time of my life and like most children starting out the training wheels had to be the first thing to go.

After a few months of riding it started getting colder outside and I knew I only had a few short weeks of riding left before I had to put the bike in the garage and wait for spring to return. Like most of the community in Minneapolis riding the bicycle is a great source of freedom and exercise in the city, but when the fall comes it is time to pack up the bicycles and store them away in a garage. A major goal for this project is to supply an indoor lifestyle that embraces one activity.

The bicycle is one of the most used forms of transportation in Minneapolis and it continues to grow as a culture while people become for understanding what positive purposes it serves. Fully understanding what it means to bike and understanding all aspects of the bicycle will be important in the creation of this architecture. When developing designs for a specific fiction you must fully understand the social, cultural and mechanical qualities of the bicycle. This will be a new breakthrough in typologies and one goal is to show people in regions similar to this that there can be solutions for activities only available in the summer.

Large commercial or public spaces can be difficult to fully understand for one person. Typically what happens in a firm that is designing a large structure like the one featured in this thesis, there is a group of people working on the building and objectives are divided into smaller groups.

A goal for this thesis is to fully understand everything there is to know about this building, not just put labels on spaces but to have each space carefully designed for the objective the space has been given. To understand the structure, the materials and everything else that is decided to be put in the space and why it is put there. What does it mean to bike and how does it feel to bike? Does it feel different inside than out?

Can you replicate the feeling of riding a bicycle on a sunny day for the interior of a building? Will biking inside during the winter time be a positive experience for a person or will it be a burden for them emotionally? The psychology is very important to me to understand what it means to ride a bicycle, and doing research on these topics for interior spaces.

Professionally, some goals that have been brought to attention that should be accomplished by the time the project is complete. To make sure the writing is understandable and diagrams are easily understood. Graphically, to create project images and floor plans with the most careful precision, to produce rendering unlike anything before to fully prepare for the life that will take place outside the walls of the university.

Lastly, the goal that will be accomplished as one final course outcome is to be professionally ready to complete any task that an architectural office has assigned. To complete an architectural space with such a large program will be the most intense of challenges, unlike anything completed before, understanding everything about this building on such a small scale for such a large building is something that will need to be done to be ready for the work outside this thesis and it will be the hardest task to complete.

SITE NARRATIVE

The site is the linden yard west and city works land to the west of downtown Minneapolis in Minnesota. The proposal is to rehabilitate the existing conditions of the land for redevelopment and construction of an indoor bicycle facility for the city of Minneapolis. Existing square footage is about 1 million square feet of space which allows plenty of space for redevelopment. Linden yard west provides a great opportunity for changes and more of a positive impact on the city from what it currently is. Currently the space is allocated and owned to the city public works facility for concrete crushing functions.

Until recently the site was inaccessible to the north and now with the recent construction of the van white memorial bridge more people are connected to south Minneapolis from the north side. The master plan for the public transit has included this area in their future light rail transit (LRT) stop. If applicable the city will constructed a LRT station immediately to the east of the van white bridge. The west linden yard has views and access to the Bryn Mawr meadows park and fabulous views of the skyline.

This area that the site is on is considered part of the Bassett Creek Valley which shares most of its land with trails, parks and a few softball fields.

At the site, the wind is strong from the northwest, and much of the southern views are obstructed by the I-394 overpass. There has been flooding here in the past but as stated in the historical context the U.S. army has come to rectify that situation a couple of decades ago and now with no flooding there is some planning for the area for commercial and residential purposes. Bassett Creek runs from Plymouth and runs just north of the site with connection to the Mississippi river.

The large collection of dirt is about seven stories tall and is quite unappealing for people coming into the city from the west. Greeted with a beautiful skyline and mountain of dirt, there should be something more desirable here to welcome people into the great downtown area, something that benefits this area.

Along the southern border of the site lies two regional bike trails, the Luce Line and the Cedar lake trail along with a walking path that all meet up at this location and travel into downtown.

Most of the site is fairly flat, any water accumulation drains into the creek and storm sewer drains underneath the interstate. The residential neighborhoods to the north suffer from a bit of noise pollution from the interstate but are far enough away that is it a very subtle impact.

The site can be very loud depending at which time you experience the location. During the morning and evening rush hour it is very loud with honking and the hum of the engine other than that not too much noise from any other direction. The Bassett Creek Valley area is about 23 acres of open land and parks, construction on the site is the only noise coming from the area.

After the relocation of the city public works facility the site should go back to normal with a more relaxing noise pollution the design of a park and bicycle center for the community. One of the first plans of action will be to add many more trees to the site because right now, as the site sits, there is very little vegetation and tree cover. This location is ideal for gatherings for people, it is easy to get to and has large open spaces in very close vicinity to downtown which is very appealing for the community.

FIGURE 20

FIGURE 20
Birds Eye Linden Yard West
by Bing
(http://www.bing.com/maps/)

Top - FIGURE 21
Old Dirt Hill
by Casey Cotcamp

Middle - FIGURE 22
Looking West
by Casey Cotcamp

Bottom - FIGURE 23
Skyline East
by Casey Cotcamp

FIGURE 24
Straight Shot
by Casey Cotcamp

Top - FIGURE 22
Van White Bridge
by Casey Cotcamp

Bottom - FIGURE 23
See The Meadows,
by Casey Cotcamp

Top - FIGURE 27
On The Path
by Casey Cotcamp

Bottom Left - FIGURE 28
The Depot
by Casey Cotcamp

Bottom Right - FIGURE 29
A Foggy Day
by Casey Cotcamp

SITE FEATURES

Railroad tracks on north border of the site, Bryn Mawr Meadows includes parks and baseball fields on the property to the north. South and west site boundaries are blocked by interstate bridges and overpasses.

Light

Natural light is very prominent, not many fixtures providing artificial light there are some on the overpass and streets nearby. What little artificial lights that do exist are a light orange color.

Vegetation

There is a tree line on the north side that separates the railroad tracks from the Bryn Mawr Meadows. Typically lush and green with leaves for summer and very sparse with little to no leaves in the winter. The actual site has absolutely no vegetation, some weeds that have accumulated over time but nothing besides that.

Water

Besides Bassett Creek that flows on the north end of Bryn Mawr Meadows there is no bodies of water that exist around the site. The creek is clean with little debris and flows into downtown and meets the Mississippi.

Wind

The wind can be strong at times when coming from the north and northwest. Statistics have claimed has heavy as 30 mph at times for the area. The interstate blocks any south wind that may affect the site.

Human Characteristics.

The site itself is used for dirt and concrete rock storage, mostly construction workers within the site boundaries. There are many people who use the parks to the north and directly on the border of the site to the south is 3 paved trails (2 bicycle and 1 pedestrian) which are constantly used by commuters and leisure riders or runners and walkers.

Soils

According to the city of Minneapolis Geotechnical Information document "Nine standard penetration test borings were performed throughout the property. Five of the borings were taken to a depth of 120 feet below existing grade. Four of the borings, in the northeast comer of the property, were taken to depths of 23 to 38 feet below existing grade. The soil 'borings encountered four distinct strata: fill, swamp deposits, alluvial deposits and glacial deposits. The borings encountered 11 to 37 feet of fill and possible fill consisting of sands with various amounts of silts and clays. Debris such as plastic, cinders, bituminous, wood, brick, limestone and concrete were encountered in the fill. Some of the fill was also organic. In general, the soil conditions were worse in the western two-thirds of the Linden Yard portion of the site. Contaminated soils excavated during construction, including the lead-contaminated tunnel spoil pile, would either have to be reused on the Site (with MPCA approval), treated and disposed of off-site, or directly disposed of off-site at an appropriately permitted facility. The concentration of leachable lead in the soil in portions of the site have been characterized as being a hazardous waste and would likely have to be handled and disposed of as such. Earthwork at the Site would require the use of 40-hour HAZWOPER-trained workers. Due to geo-technically poor soil conditions at the site, deep pilings would most likely be required for support of buildings and utilities." (Braun Intertec, 1998b)

Water Table

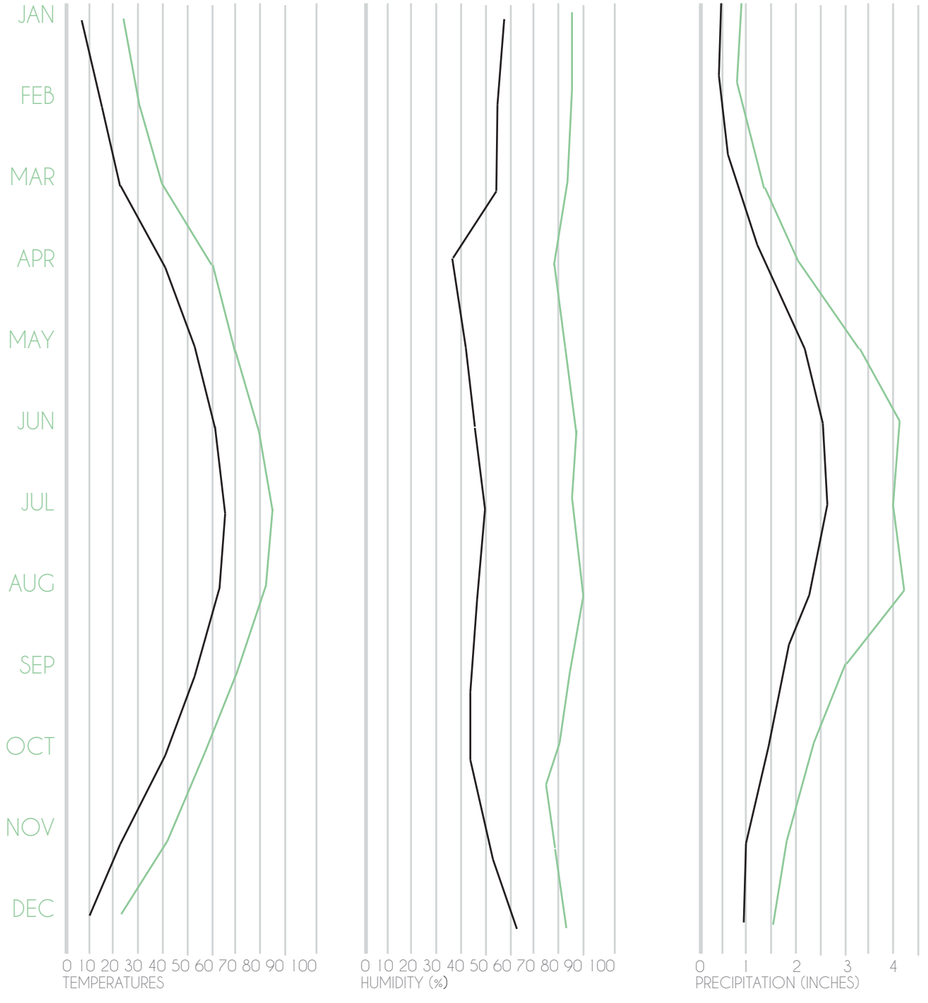
"Groundwater was typically encountered at 11 to 14 feet below the surface at the boring locations. Groundwater was usually encountered wherever organic soils were encountered. It is possible that the water table has been drawn down due to construction of drainage systems such as the Bassett Creek drainage system consisting of a. covered box culvert or due to other grading that has occurred around this particular property." (Braun Intertec, 1998b)

Utilities

Typical power lines exist around the site and water drainage from roads is regular.

Vehicular Traffic

Currently the site is operated by large construction truck. The only traffic in the immediate vicinity is the traffic on the overpass on the interstate.

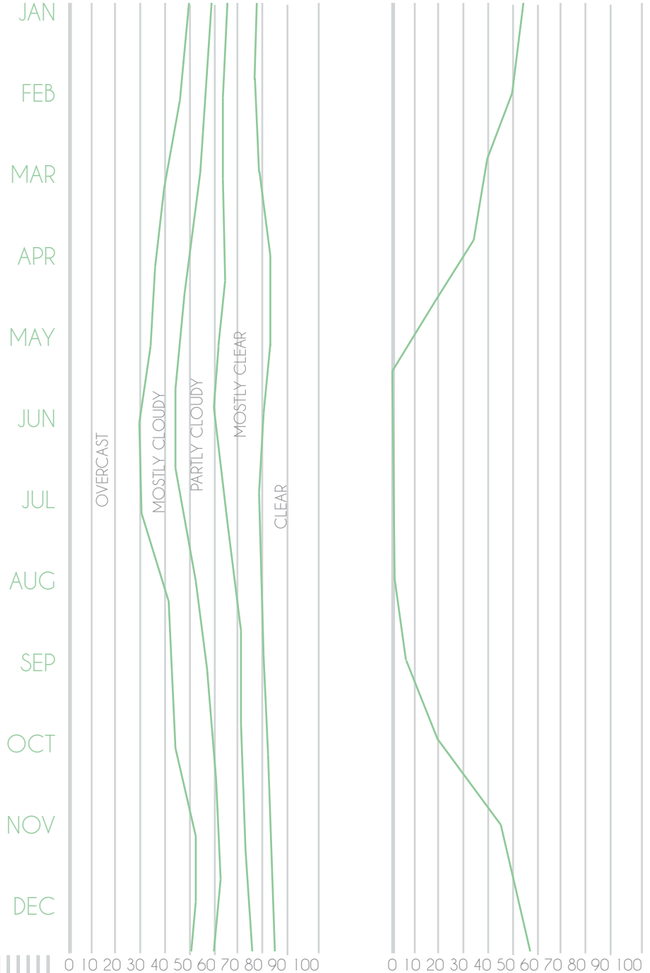


CLIMATE DATA

AVG. HIGH

AVG. LOW

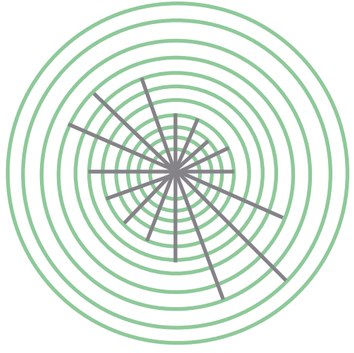
Table 3
Temp. Hum. Percip.
by Casey Cotcamp



CLOUDINESS (% PROBABILITY DAILY)

SNOWFALL (% PROBABILITY DAILY)

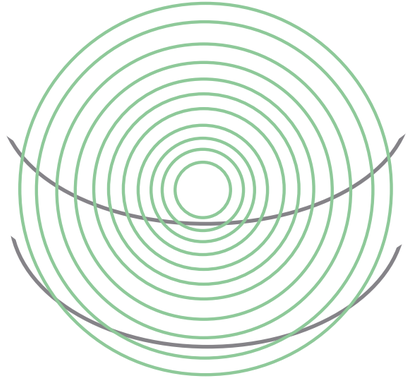
WIND SPEED (MPH)



WIND DIRECTION ANNUAL (%)

Left - Table 4
Cloud, Snow & Wind
by Casey Cotcamp

Right - Table 5
Wind Direction
by Casey Cotcamp



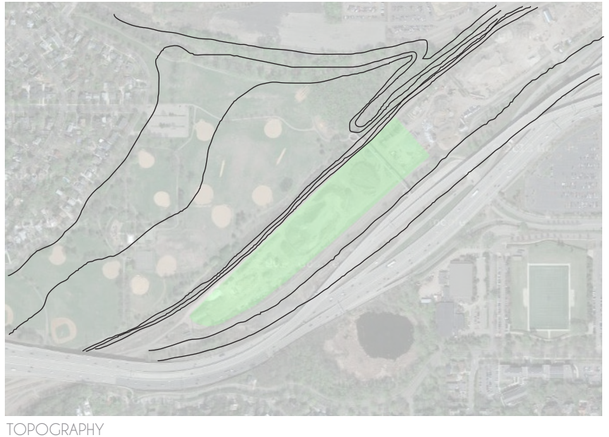
SUN PATH DIAGRAM

Left - Table 6
Sun Path
by Casey Cotcamp

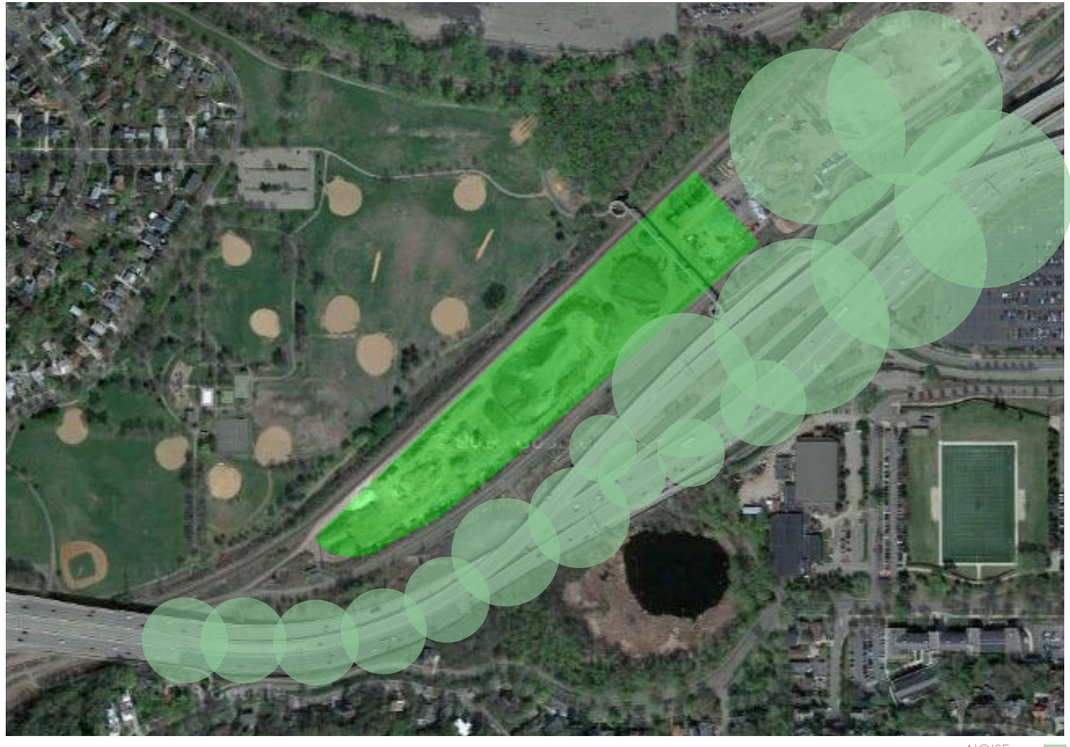
Top Right - Figure 30
Air Movement
by Casey Cotcamp

Top Right - Figure 31
Topography
by Casey Cotcamp

AIR MOVEMENT



TOPOGRAPHY



NOISE

SLOPE 2%

Figure 32
Noise
by Casey Cotcamp

PROGRAM

Lobby - 9,000 s.f.
Bike Track - 48,000 s.f.
Bike Shop & Repair Area - 3,000 s.f. (350 bikes)
Bike Storage - 18,000 s.f. (1524 bikes)
Lockers - 8,000 s.f.
Offices - 900 s.f.
Event/Conference Space - 2,800 (80 -100 people)
Cafe – 5,320 s.f.
Education Area / Day Care – 11,800 s.f.
Outdoor 'Off-Road' Course - 37,000 s.f.
Spinning Class - 3,000 s.f. (3 Rooms)
Open Atrium Space - 134,000 s.f.
Mechanical - 21,300 s.f.

Nice-Ride Bike Station
Bus stop

Table 7
Program
by Casey Cotcamp

TABLE 7

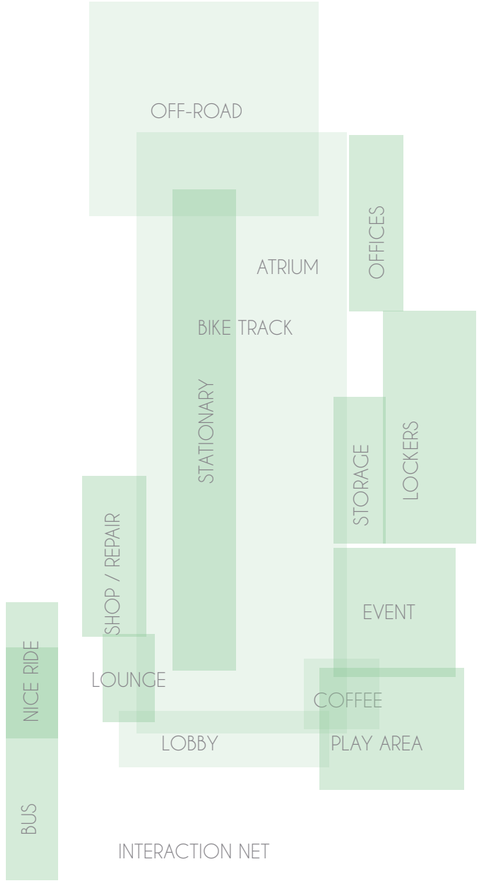
INTERACTION MATRIX

Necessary

Desirable

	Lobby	Bike Track	Bike Shop & Repair Area	Bike Storage	Lockers	Offices	Event/Conference Space	Coffee Shop/Juice Bar	Children Play Area / Day Care	'Off-road' course	Stationary bike areas	Bike-Customization area	Lounge area	Nice-Ride Station	Bus stop	Open Atrium
Lobby	●		●	○		○	○	○	●			○	●	●	●	
Bike Track		●		○	●					●	●	○				●
Bike Shop & Repair Area	○		●	●	●		●	●				●				
Bike Storage			●	●								●				
Lockers	○	●			●						●					●
Offices						●	●						○			●
Event/Conference Space	○						●		●				●			
Coffee Shop/Juice Bar	○		○	○				●					●			
Children Play Area / Day Care	●								●				●			
'Off-road' course		●		○	●					●	●					●
Stationary bike areas		●			●					●	●					●
Bike-Customization area	●		●	●								●				
Lounge area	●												●			●
Nice-Ride Station	●													●	●	
Bus stop	●												●	●	●	
Open Atrium		●	●				●	●	●		●		●			●

Table 8
To Matrix
by Casey Cotcamp



INTERACTION NET

Figure 33
To Interact
by Casey Cotcamp

Figure 34
Lost Winter Biker
by Doug Berham
(articles.latimes.com)

Figure 35
Quick Winter Ride
by Josh Greenberg
(theideaslab.wordpress.com)

Figure 36
Stuck In The Snow
by Max Kemp
(mec.ca/main/services)

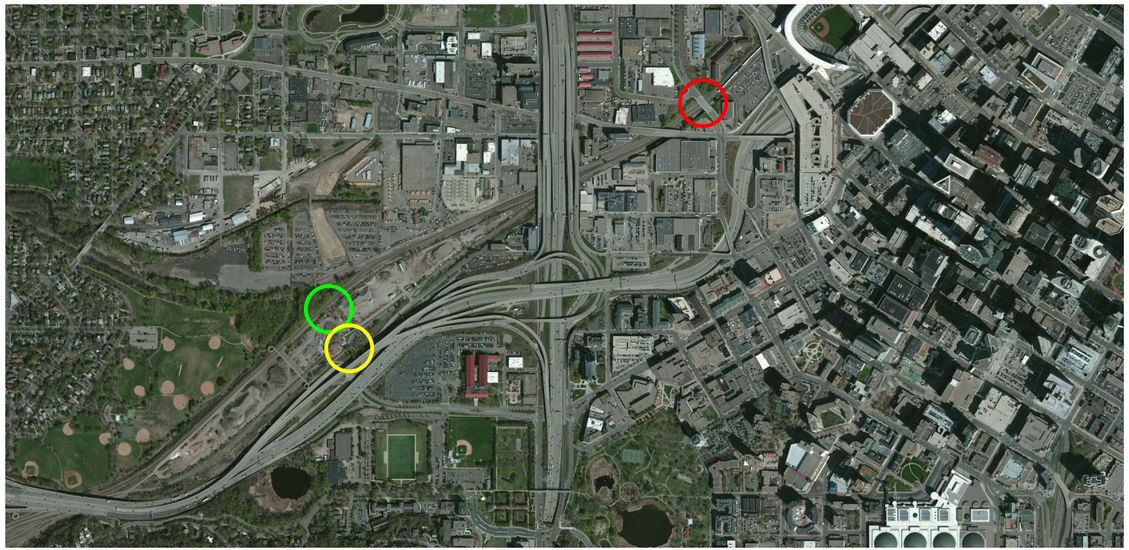
PROJECT DESIGN GOALS

FOUR SEASON USAGE

LARGE PARK ENVIRONMENT

CLOSE TO DOWNTOWN

TRANSIT ACCESSIBILITY



PUBLIC TRANSPORTATION ANALYSIS

EXISTING LIGHT RAIL TERMINATION

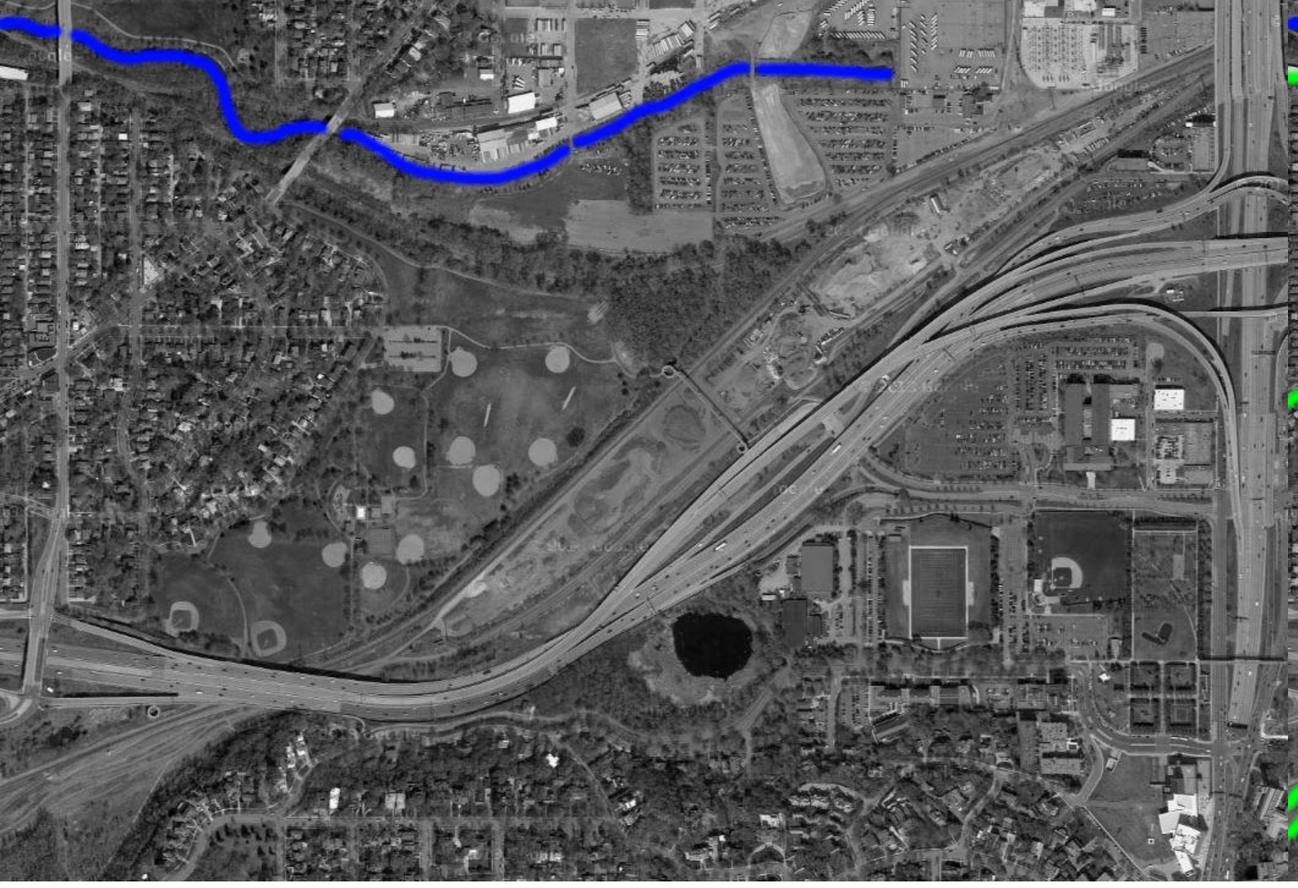
PROPOSED LIGHT RAIL EXTENSION

EXISTING BUS STOP

Figure 37
Transportation Map 1
by Google Maps
(www.maps.google.com)

PUBLIC TRANSPORTATION ANALYSIS

Figure 38
Transportation Map 2
by City Of Minneapolis
(www.ci.minneapolis.com)



BASSETT CREEK

Figure 39
Bassett Creek Map
by Google Maps
(www.maps.google.com)

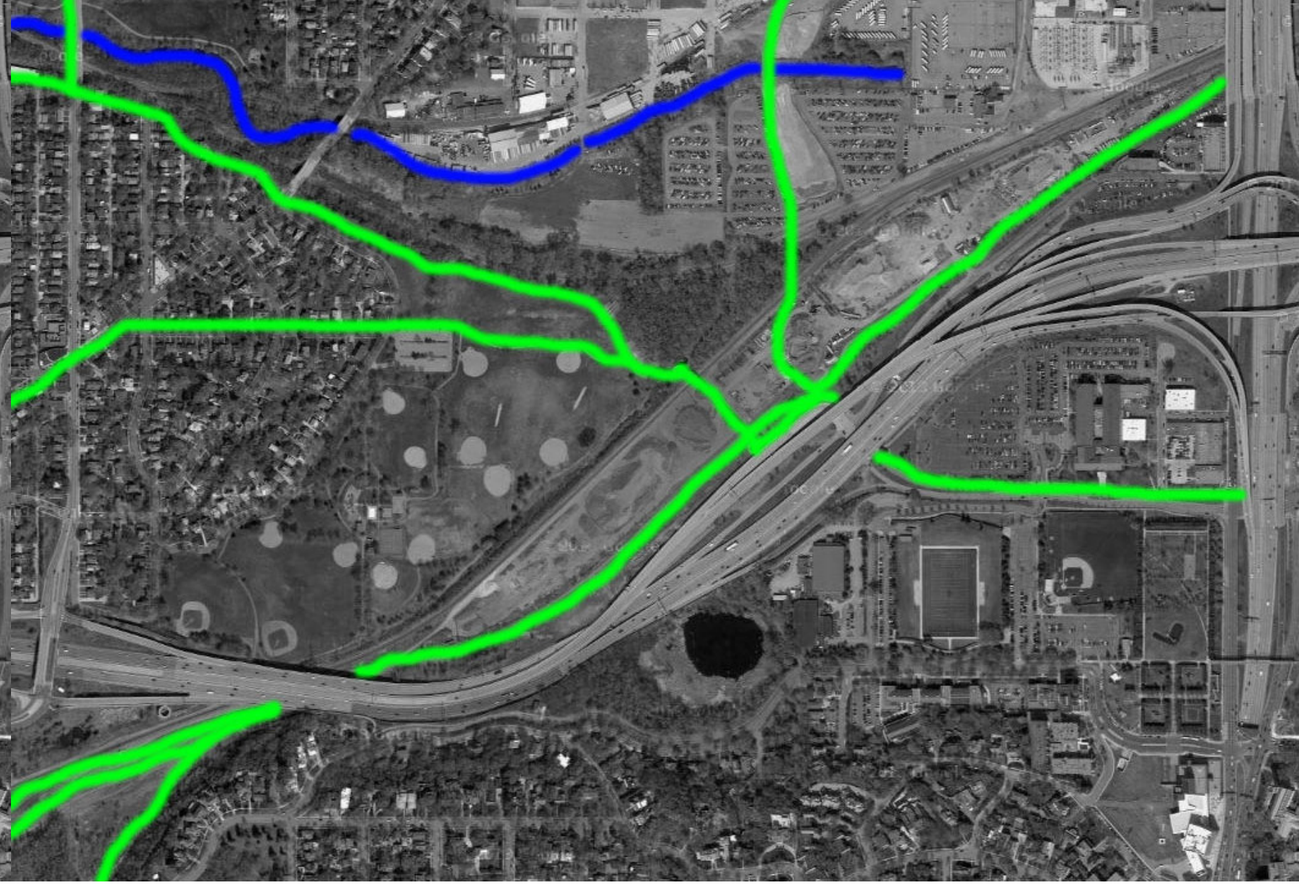


Figure 40
Bassett Creek & Bike Map
by Google Maps
(www.maps.google.com)

PUBLIC BIKE TRAILS IN IMMEDIATE VICINITY

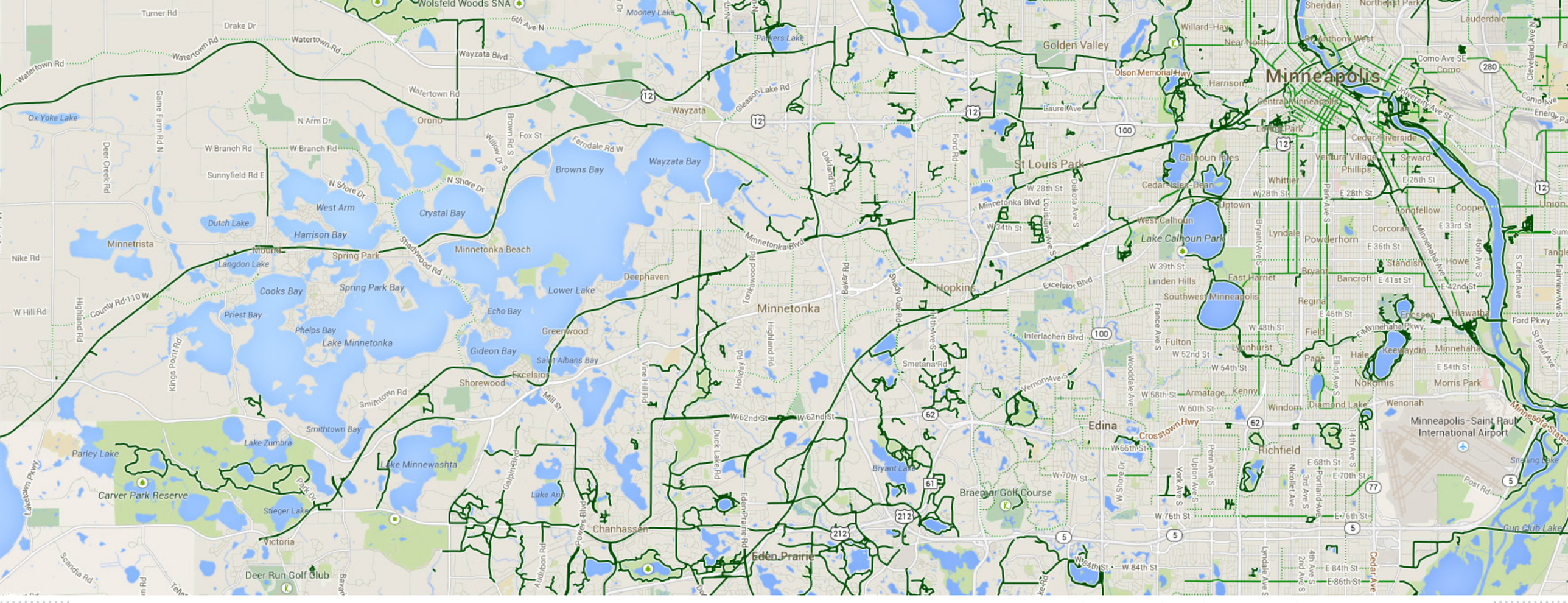


Figure 4.1
Bike Path Map
by Google Maps
(www.maps.google.com)

MINNEAPOLIS AND SURROUNDING AREA PUBLIC BICYCLE MAP

Figure 42
Birds Eye - Linden Yard West
by Google Maps
(www.maps.google.com)

Figure 43
Birds Eye - Linden Yard West - B&W
by Google Maps
(www.maps.google.com)

Figure 44
Site Setbacks
by Google Maps
(www.maps.google.com)

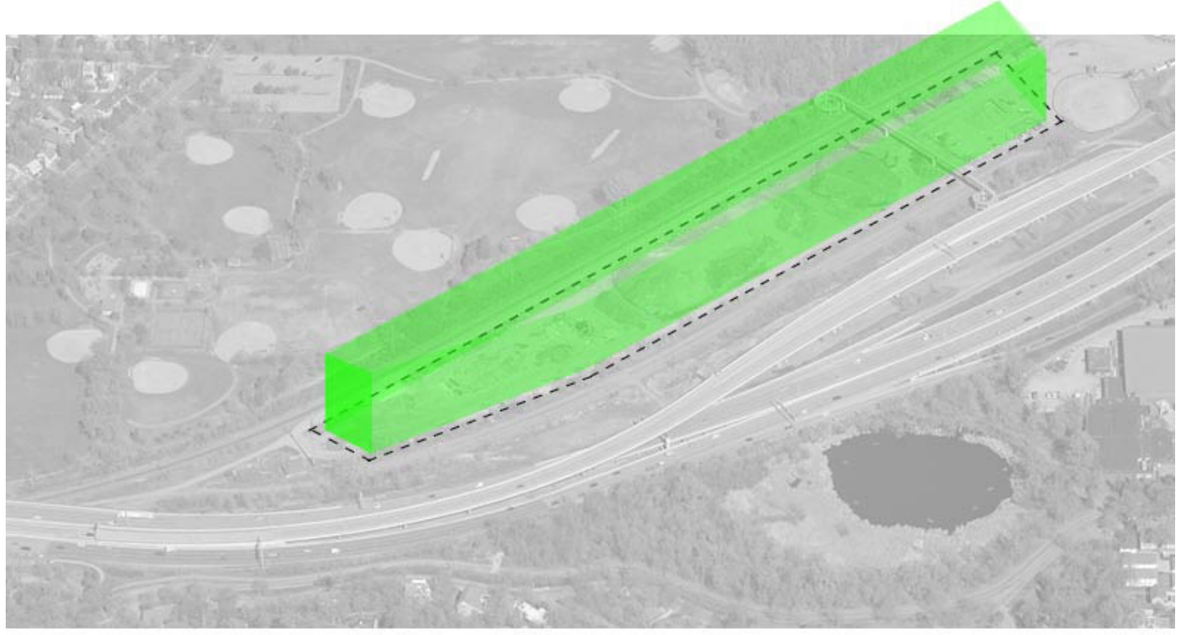


Figure 45
Building Potential
by Google Maps
(www.maps.google.com)

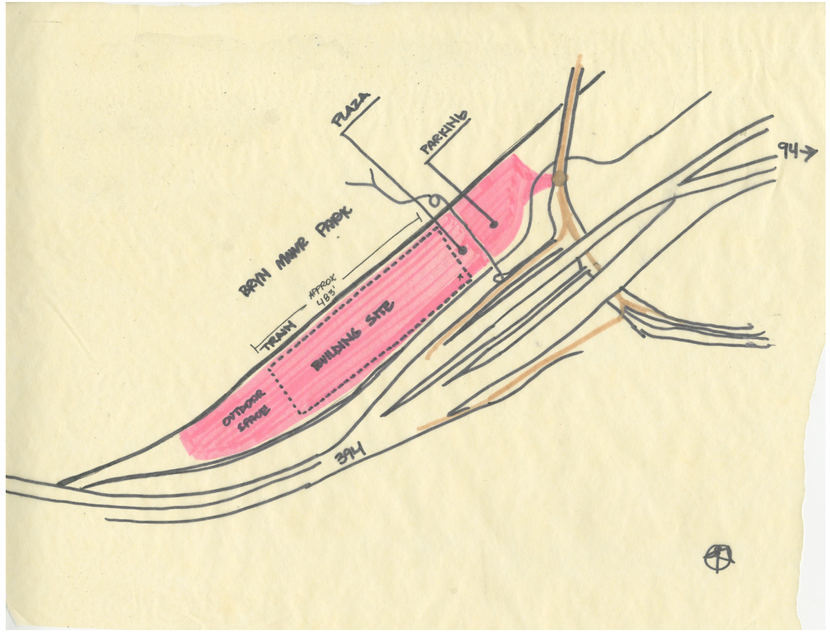
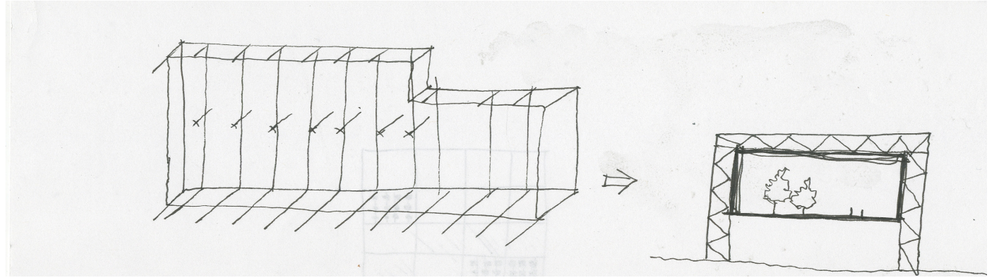


Figure 46
Site Process 1
by Casey Cotcamp



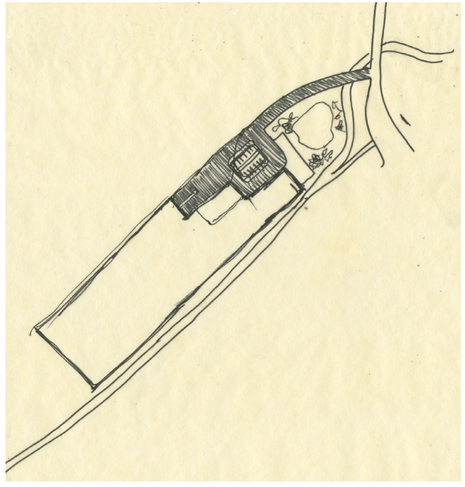


Figure 47
Site Process 2
by Casey Cotcamp

Figure 48
Site Process 3
by Casey Cotcamp

Figure 49
The Cyclist
by Tim Kessler
(www.renderfriend.blogspot.com)

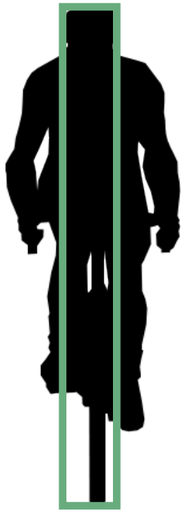


Figure 50
The Cyclist Profile
by Casey Cotcamp

STRENGTH & BALANCE

In this moment the bicycle relies on the cyclist to maintain stability. Using the strength of the cyclist and the movement the bicycle itself provides balance and at this moment harmony is created.

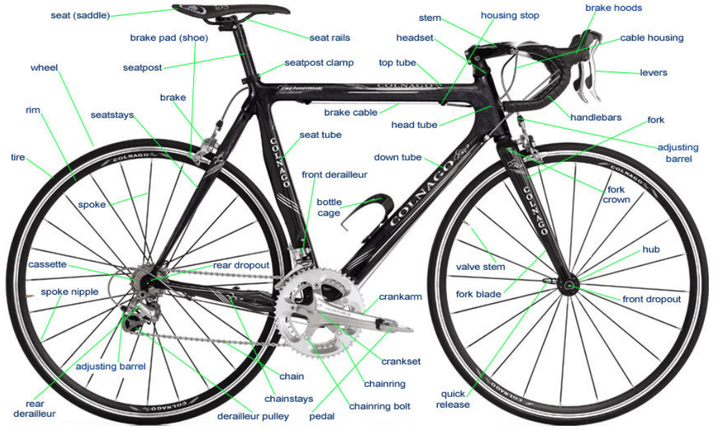


Figure 51
Bicycle Mechanics
by Jim Langley
(www.jimlangley.net/)

Figure 52
Profile Bicycle
by Casey Cotcamp

POWER & WEIGHT

The frame of the bicycle is lightweight and is able to withstand an enormous amount of pressure. The compression that is produced by load is evenly distributed throughout the frame of the bicycle and is dispersed to the ground.

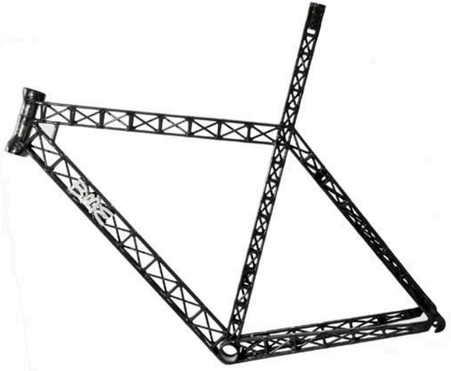


Figure 53
Bicycle Frame 1
by Stradalli Cycle
(www.stradalli.blogspot.com)

Figure 54
Bicycle Frame 2
by Brano Meres
(www.bikestein.com/blog/eiffel)

Figure 55
Bicycle Frame 3
by Brano Meres
(www.bikestein.com/blog/eiffel)

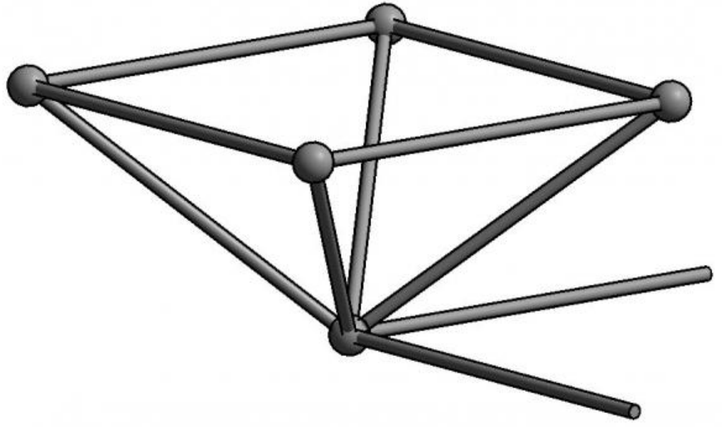
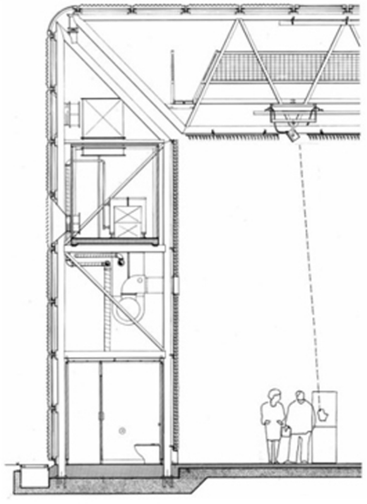
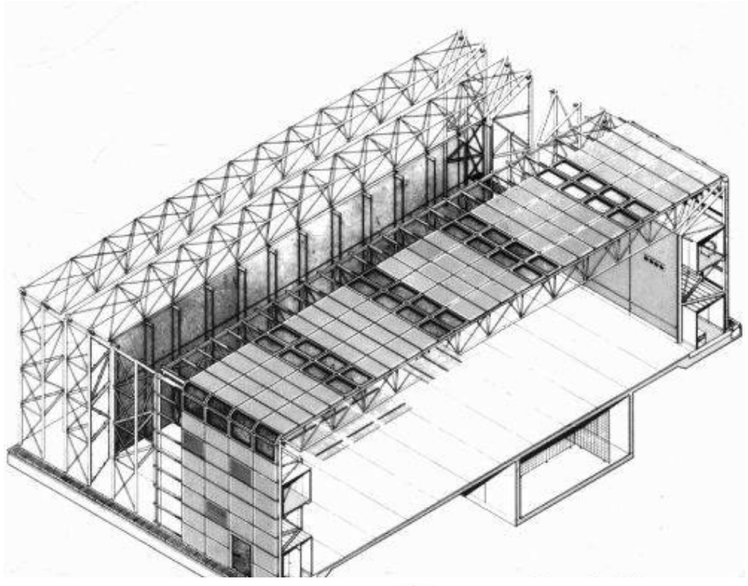


Figure 56
Space Frame Component
by User: revitworker2011
(www.revitcity.com)

SAINSBURY CENTER FOR VISUAL ARTS
NORWICH, UK





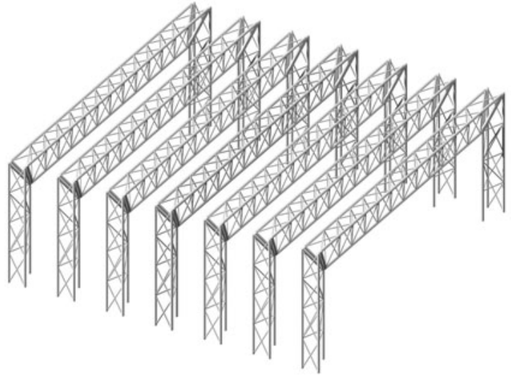


Figure 57
SCFVA Collection
by Norman Foster
(www.fosterandpartners.com)

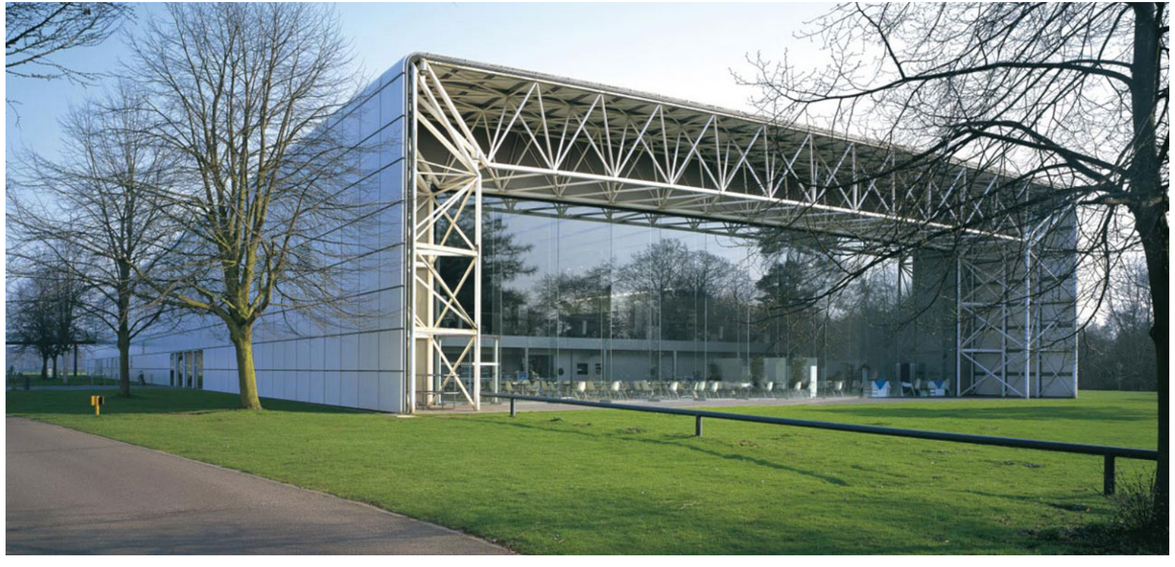
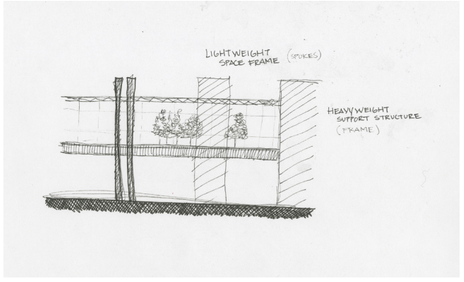
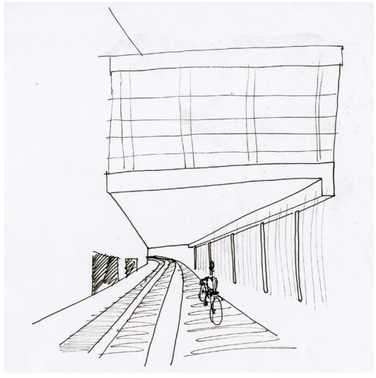


Figure 58
SCFVA Exterior
by Norman Foster
(www.fosterandpartners.com)





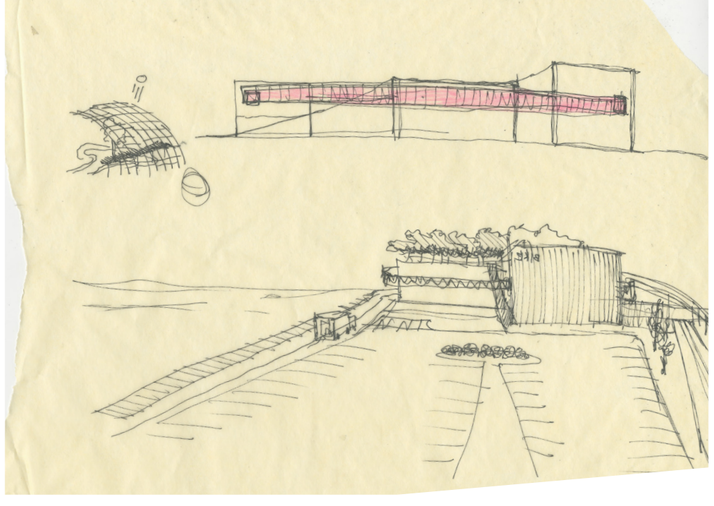
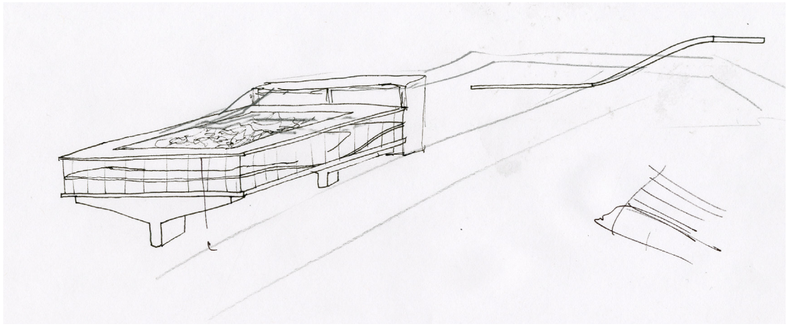
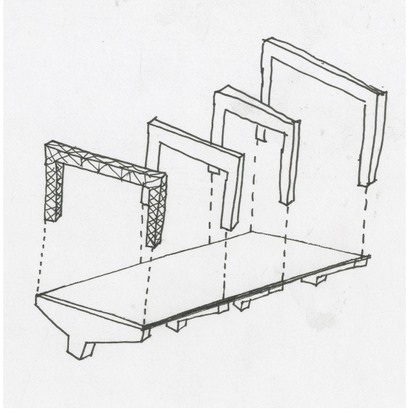


Figure 59
Process Collection 1
by Casey Cotcamp





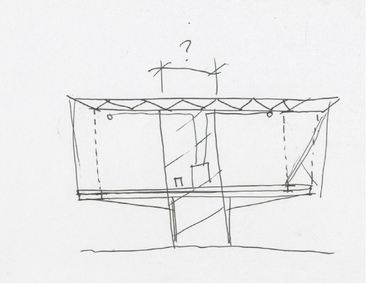


Figure 60
Process Collection 2
by Casey Cotcamp

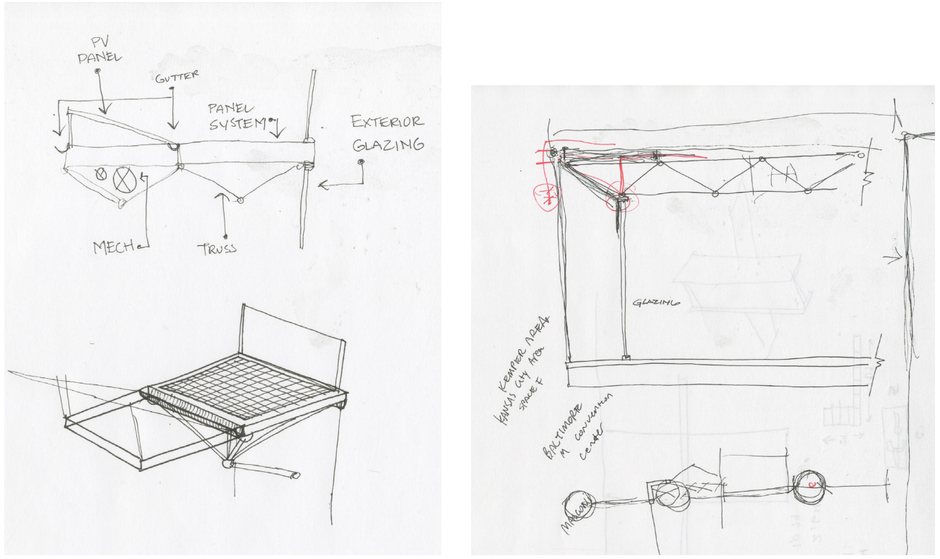


Figure 61
Process Collection 3
by Casey Cotcamp

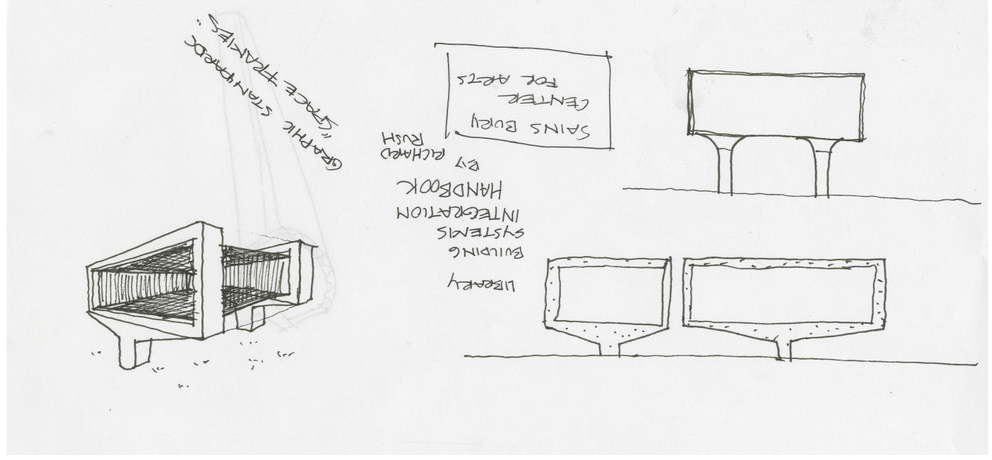


Figure 62
Process Collection 4
by Casey Cotcamp

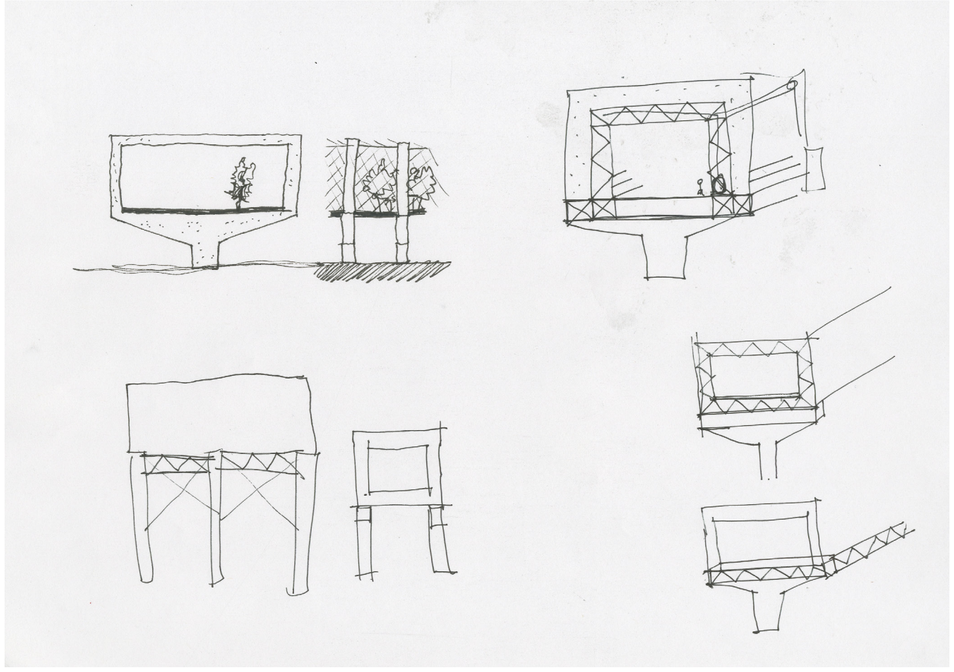
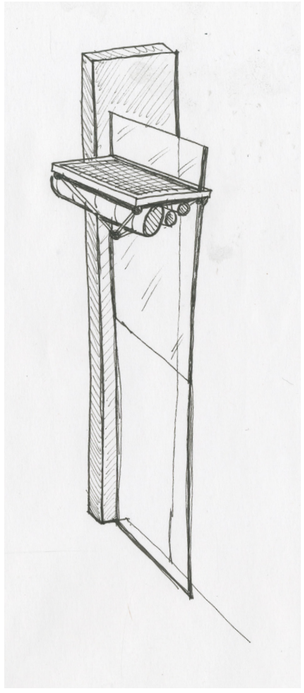


Figure 63
Process Collection 5
by Casey Cotcamp



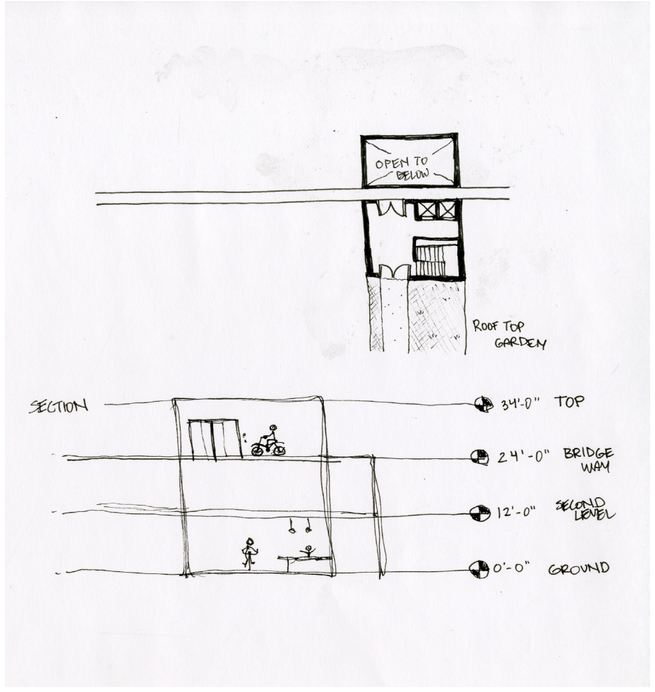


Figure 64
Process Collection 6
by Casey Cotcamp

Figure 65
Bike Storage
by Bradford Systems
(www.bradfordsystems.com)

Figure 66
More Bike Storage
by Land Of Bicycles
(www.personalexcellence.com)

Figure 67
Greenhouse Outside
by Flat-Roof Greenhouse
(www.gpnmag.com)

Figure 68
Indoor Greenhouse
by Rough Brothers Manufacturing
(www.roughbros-mfg.en.alibaba.com)

ATOCHA STATION
MADRID, ES

Figure 69
Atocha Station
by Wikipedia
(www.en.wikipedia.org)

Figure 70
Tree Soil Depth
by Home Advisor
(www.pro.homeadvisor.com)

MITCHELL PARK CONSERVATORY
MILWAUKEE, WI

Figure 7.1.
Mitchell Conservatory
by Conservatory Photographers
(www.loc.gov)

PEOPLE & PLACE

Winter can be a hard time for many people who live in climates much like Minneapolis. During these cold dark months people struggle with day to day activities, become tired and lack motivation to do anything outside of the house. The Bassett Creek Pedal Club is a space for people to come and enjoy a fresh and comfortable environment while staying active and being around people. Centrally located, the Pedal Club provides easy access to freeways and bike trails. Close to neighborhoods, placed directly on top of the Cedar Lake Bike Path and only a mile from downtown, people from all parts of the metro will be able to experience the building.

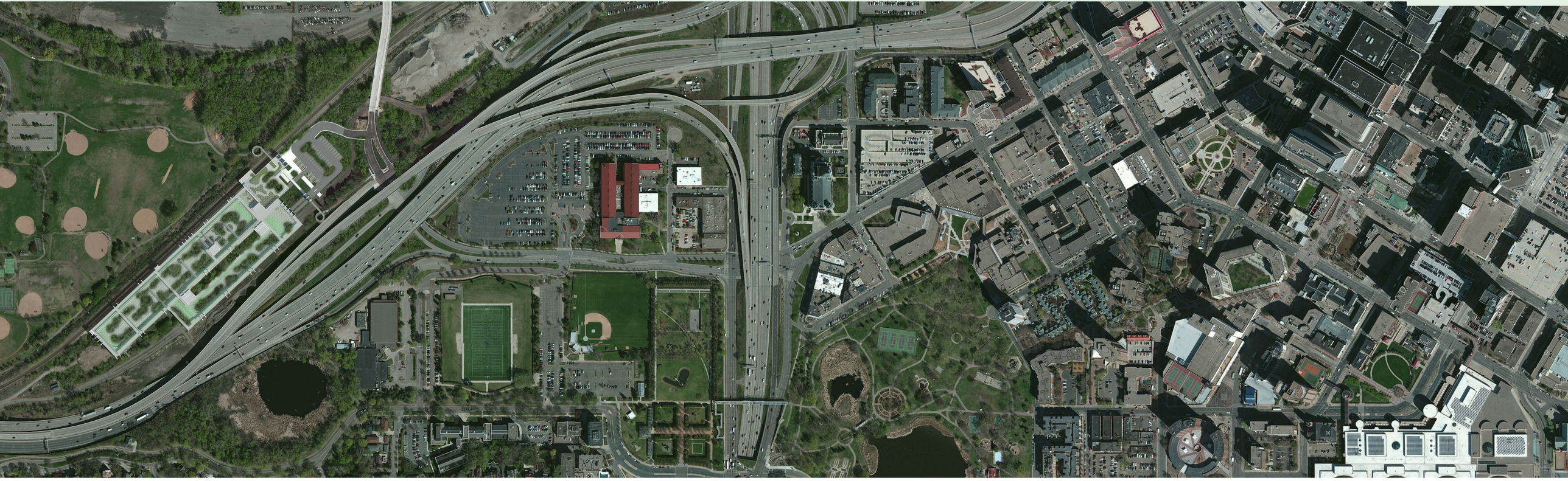
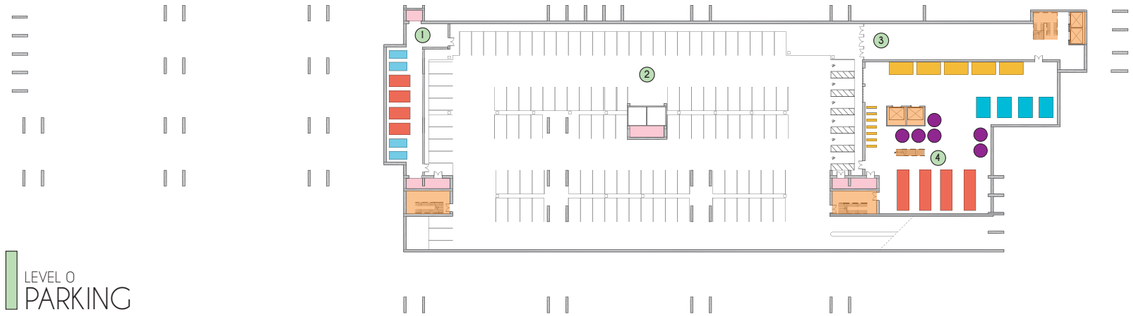


Figure 72
Site Plan
by Casey Cotcamp & Google Maps
(www.maps.google.com

SITE PLAN



LEVEL 0
PARKING

KEY & LEGEND

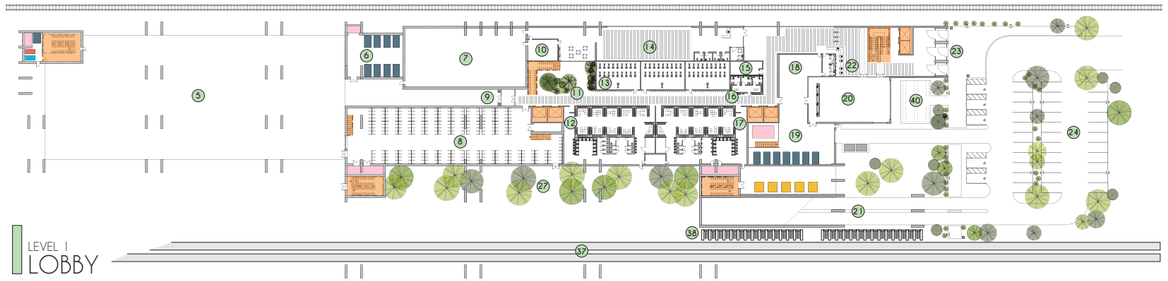
1. MECHANICAL
2. PARKING - *124 STALLS*
3. LOWER LEVEL ENTRY
4. MECHANICAL
5. OUTDOOR DIRT TRACK
6. MECHANICAL
7. DAYCARE - OUTDOOR
8. BICYCLE STORAGE
9. REAR ENTRY
10. DAYCARE - STORAGE
11. ATRIUM LOBBY
12. WOMENS LOCKER ROOM
13. SPINNING ROOMS
14. DAYCARE
15. CUSTODIAN SPACE
16. FAMILY LOCKER ROOM
17. MENS LOCKER ROOM
18. SHOP STORAGE
19. MECHANICAL
20. PUBLIC SHOP / MAINTENANCE
21. LOWER PARKING ENTRY
22. RECEPTION / CHECK-IN
23. ENTRY
24. SURFACE PARKING - *39 STALLS*
25. KINETIC STATIONARY BICYCLES
26. BICYCLE PARK / CLUB
27. TREE COURTYARD
28. PUBLIC CAFE
29. LEVEL 2 RECEPTION / CHECK-IN
30. PUBLIC RESTROOMS
31. OFFICES
32. PUBLIC CONFERENCE / MEETING
33. LEVEL 2 ENTRY
34. KINETIC TRACK
35. OUTDOOR PLAZA
36. ROOFTOP MAINTENANCE WALKWAY
37. EXISTING BIKE PATH - *'CEDAR LAKE TRAIL'*
38. NICE-RIDE BIKE SHARE STATION
39. EXISTING PEDESTRIAN BICYCLE BRIDGE
40. BIKE RACK

CHILLER
BOILER
VERTICAL DUCT SHAFT
ELECTRICAL
AIR HANDLER
WATER COLLECTION
OPEN TO BELOW
VERTICAL CIRCULATION
GRASS
PAVEGEN™ KINETIC FLOOR
PV PANELS

0 12 48 200
6 24 100

83,000 s.f.

Figure 7.3
Parking Level
by Casey Cotcamp



LEVEL 1
LOBBY

KEY & LEGEND

1. MECHANICAL
2. PARKING - *124 STALLS*
3. LOWER LEVEL ENTRY
4. MECHANICAL
5. OUTDOOR DIRT TRACK
6. MECHANICAL
7. DAYCARE - OUTDOOR
8. BICYCLE STORAGE
9. REAR ENTRY
10. DAYCARE - STORAGE
11. ATRIUM LOBBY
12. WOMENS LOCKER ROOM
13. SPINNING ROOMS
14. DAYCARE
15. CUSTODIAN SPACE
16. FAMILY LOCKER ROOM
17. MENS LOCKER ROOM
18. SHOP STORAGE
19. MECHANICAL
20. PUBLIC SHOP / MAINTENANCE
21. LOWER PARKING ENTRY
22. RECEPTION / CHECK-IN
23. ENTRY
24. SURFACE PARKING - *39 STALLS*
25. KINETIC STATIONARY BICYCLES
26. BICYCLE PARK / CLUB
27. TREE COURTYARD
28. PUBLIC CAFE
29. LEVEL 2 RECEPTION / CHECK-IN
30. PUBLIC RESTROOMS
31. OFFICES
32. PUBLIC CONFERENCE / MEETING
33. LEVEL 2 ENTRY
34. KINETIC TRACK
35. OUTDOOR PLAZA
36. ROOFTOP MAINTENANCE WALKWAY
37. EXISTING BIKE PATH - *'CEDAR LAKE TRAIL'*
38. NICE-RIDE BIKE SHARE STATION
39. EXISTING PEDESTRIAN BICYCLE BRIDGE
40. BIKE RACK

- CHILLER
- BOILER
- VERTICAL DUCT SHAFT
- ELECTRICAL
- AIR HANDLER
- WATER COLLECTION
- OPEN TO BELOW
- VERTICAL CIRCULATION
- GRASS
- PAVEGEN™ KINETIC FLOOR
- PV PANELS

0 12 48 200
6 24 100

66,000 s.f.

Figure: 74
Lobby Level
by Casey Cotcamp

LEVEL 2
CLUB

KEY & LEGEND

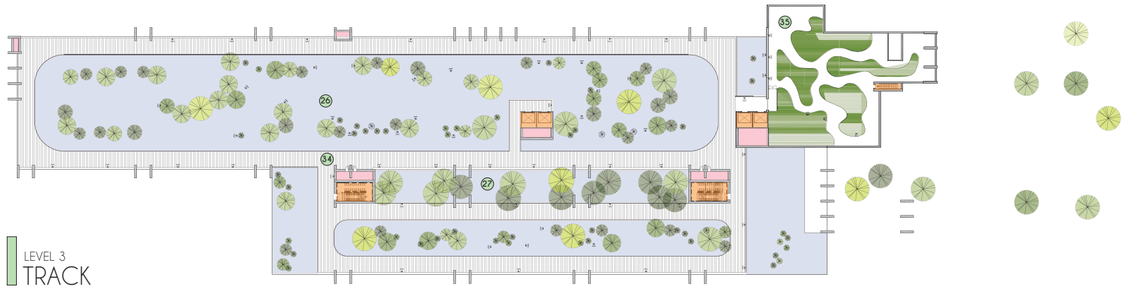
1. MECHANICAL
2. PARKING - *124 STALLS*
3. LOWER LEVEL ENTRY
4. MECHANICAL
5. OUTDOOR DIRT TRACK
6. MECHANICAL
7. DAYCARE - OUTDOOR
8. BICYCLE STORAGE
9. REAR ENTRY
10. DAYCARE - STORAGE
11. ATRIUM LOBBY
12. WOMENS LOCKER ROOM
13. SPINNING ROOMS
14. DAYCARE
15. CUSTODIAN SPACE
16. FAMILY LOCKER ROOM
17. MENS LOCKER ROOM
18. SHOP STORAGE
19. MECHANICAL
20. PUBLIC SHOP / MAINTENANCE
21. LOWER PARKING ENTRY
22. RECEPTION / CHECK-IN
23. ENTRY
24. SURFACE PARKING - *39 STALLS*
25. KINETIC STATIONARY BICYCLES
26. BICYCLE PARK / CLUB
27. TREE COURTYARD
28. PUBLIC CAFE
29. LEVEL 2 RECEPTION / CHECK-IN
30. PUBLIC RESTROOMS
31. OFFICES
32. PUBLIC CONFERENCE / MEETING
33. LEVEL 2 ENTRY
34. KINETIC TRACK
35. OUTDOOR PLAZA
36. ROOFTOP MAINTENANCE WALKWAY
37. EXISTING BIKE PATH - *'CEDAR LAKE TRAIL'*
38. NICE-RIDE BIKE SHARE STATION
39. EXISTING PEDESTRIAN BICYCLE BRIDGE
40. BIKE RACK

- CHILLER
- BOILER
- VERTICAL DUCT SHAFT
- ELECTRICAL
- AIR HANDLER
- WATER COLLECTION
- OPEN TO BELOW
- VERTICAL CIRCULATION
- GRASS
- PAVEGEN™ KINETIC FLOOR
- PV PANELS

0 12 48 200
6 24 100

134,000 s.f.

Figure 75 :
Club Level
by Casey Cotcamp



LEVEL 3
TRACK

KEY & LEGEND

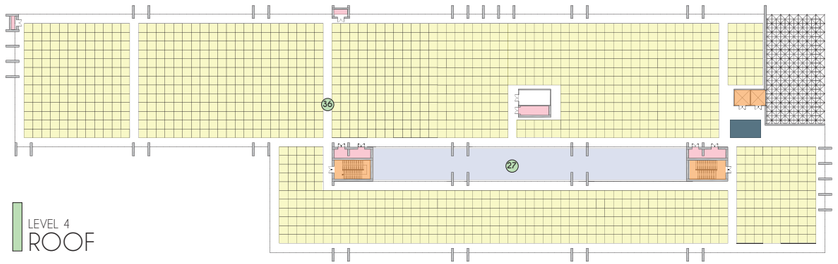
1. MECHANICAL
2. PARKING - *124 STALLS*
3. LOWER LEVEL ENTRY
4. MECHANICAL
5. OUTDOOR DIRT TRACK
6. MECHANICAL
7. DAYCARE - OUTDOOR
8. BICYCLE STORAGE
9. REAR ENTRY
10. DAYCARE - STORAGE
11. ATRIUM LOBBY
12. WOMENS LOCKER ROOM
13. SPINNING ROOMS
14. DAYCARE
15. CUSTODIAN SPACE
16. FAMILY LOCKER ROOM
17. MENS LOCKER ROOM
18. SHOP STORAGE
19. MECHANICAL
20. PUBLIC SHOP / MAINTENANCE
21. LOWER PARKING ENTRY
22. RECEPTION / CHECK-IN
23. ENTRY
24. SURFACE PARKING - *39 STALLS*
25. KINETIC STATIONARY BICYCLES
26. BICYCLE PARK / CLUB
27. TREE COURTYARD
28. PUBLIC CAFE
29. LEVEL 2 RECEPTION / CHECK-IN
30. PUBLIC RESTROOMS
31. OFFICES
32. PUBLIC CONFERENCE / MEETING
33. LEVEL 2 ENTRY
34. KINETIC TRACK
35. OUTDOOR PLAZA
36. ROOFTOP MAINTENANCE WALKWAY
37. EXISTING BIKE PATH - *'CEDAR LAKE TRAIL'*
38. NICE-RIDE BIKE SHARE STATION
39. EXISTING PEDESTRIAN BICYCLE BRIDGE
40. BIKE RACK

- CHILLER
- BOILER
- VERTICAL DUCT SHAFT
- ELECTRICAL
- AIR HANDLER
- WATER COLLECTION
- OPEN TO BELOW
- VERTICAL CIRCULATION
- GRASS
- PAVEGEN™ KINETIC FLOOR
- PV PANELS

0 12 48 200
6 24 100

49,000 s.f.

Figure 76
Track Level
by Casey Cotcamp



LEVEL 4
ROOF

KEY & LEGEND

1. MECHANICAL
2. PARKING - *124 STALLS*
3. LOWER LEVEL ENTRY
4. MECHANICAL
5. OUTDOOR DIRT TRACK
6. MECHANICAL
7. DAYCARE - OUTDOOR
8. BICYCLE STORAGE
9. REAR ENTRY
10. DAYCARE - STORAGE
11. ATRIUM LOBBY
12. WOMENS LOCKER ROOM
13. SPINNING ROOMS
14. DAYCARE
15. CUSTODIAN SPACE
16. FAMILY LOCKER ROOM
17. MENS LOCKER ROOM
18. SHOP STORAGE
19. MECHANICAL
20. PUBLIC SHOP / MAINTENANCE
21. LOWER PARKING ENTRY
22. RECEPTION / CHECK-IN
23. ENTRY
24. SURFACE PARKING - *39 STALLS*
25. KINETIC STATIONARY BICYCLES
26. BICYCLE PARK / CLUB
27. TREE COURTYARD
28. PUBLIC CAFE
29. LEVEL 2 RECEPTION / CHECK-IN
30. PUBLIC RESTROOMS
31. OFFICES
32. PUBLIC CONFERENCE / MEETING
33. LEVEL 2 ENTRY
34. KINETIC TRACK
35. OUTDOOR PLAZA
36. ROOFTOP MAINTENANCE WALKWAY
37. EXISTING BIKE PATH - *'CEDAR LAKE TRAIL'*
38. NICE-RIDE BIKE SHARE STATION
39. EXISTING PEDESTRIAN BICYCLE BRIDGE
40. BIKE RACK

- CHILLER
- BOILER
- VERTICAL DUCT SHAFT
- ELECTRICAL
- AIR HANDLER
- WATER COLLECTION
- OPEN TO BELOW
- VERTICAL CIRCULATION
- GRASS
- PAVEGEN™ KINETIC FLOOR
- PV PANELS

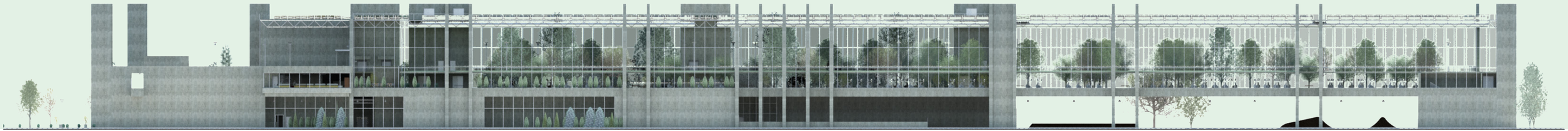
0 12 48 200
6 24 100

Figure 27
Roof Level
by Casey Cotcamp

Figure: 78
East Elevation
by Casey Cotcamp

EAST ELEVATION

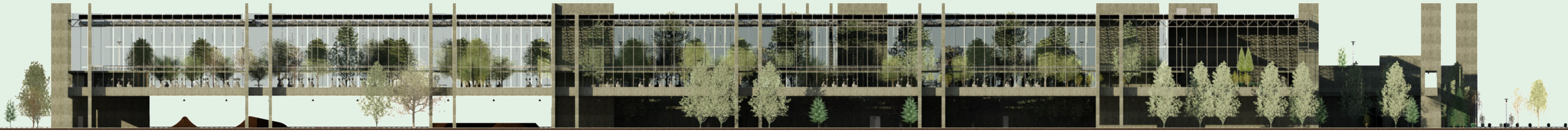
0' 10'



NORTH ELEVATION

0' 10'

Figure 79
North Elevation
by Casey Cotcamp



SOUTH ELEVATION

0' 10'

Figure 80
South Elevation
by Casey Cotcamp

WEST ELEVATION

0' 10'

Figure 8.1
West Elevation
by Casey Cotcamp

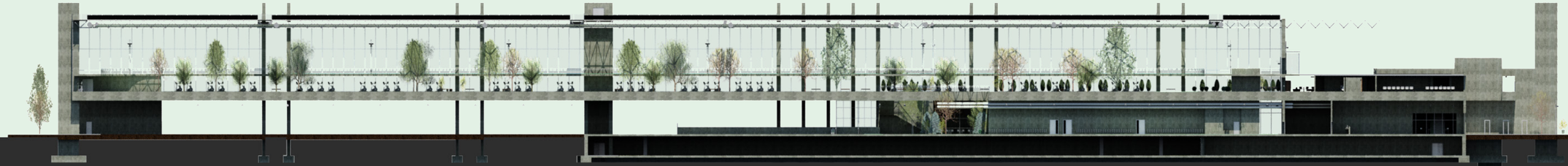
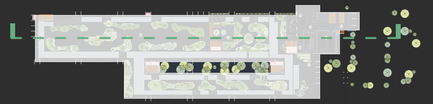
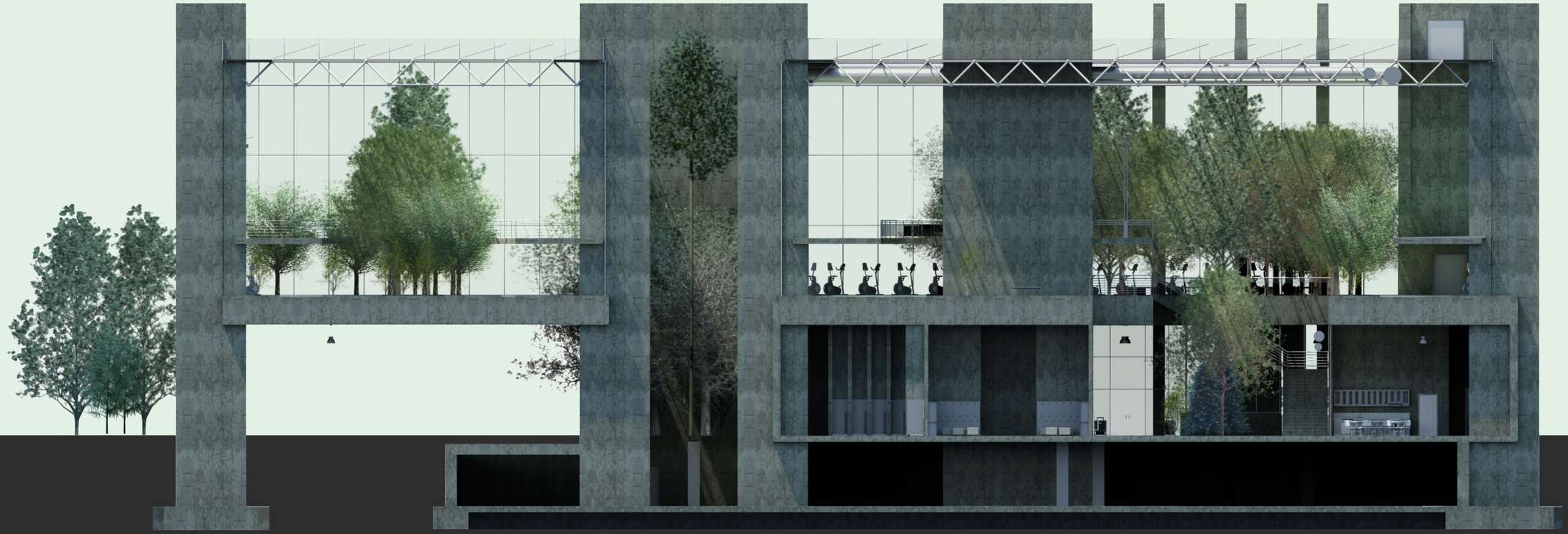


Figure 82
Section 1
by Casey Cotcamp



NORTH / SOUTH SECTION



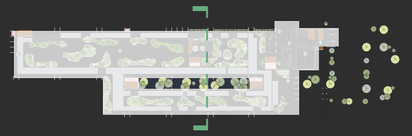


Figure 83
Section 2
by Casey Cotcamp

EAST / WEST SECTION

Figure 84
Entry
by Casey Cotcamp

Figure 85
Lobby
by Casey Cotcamp

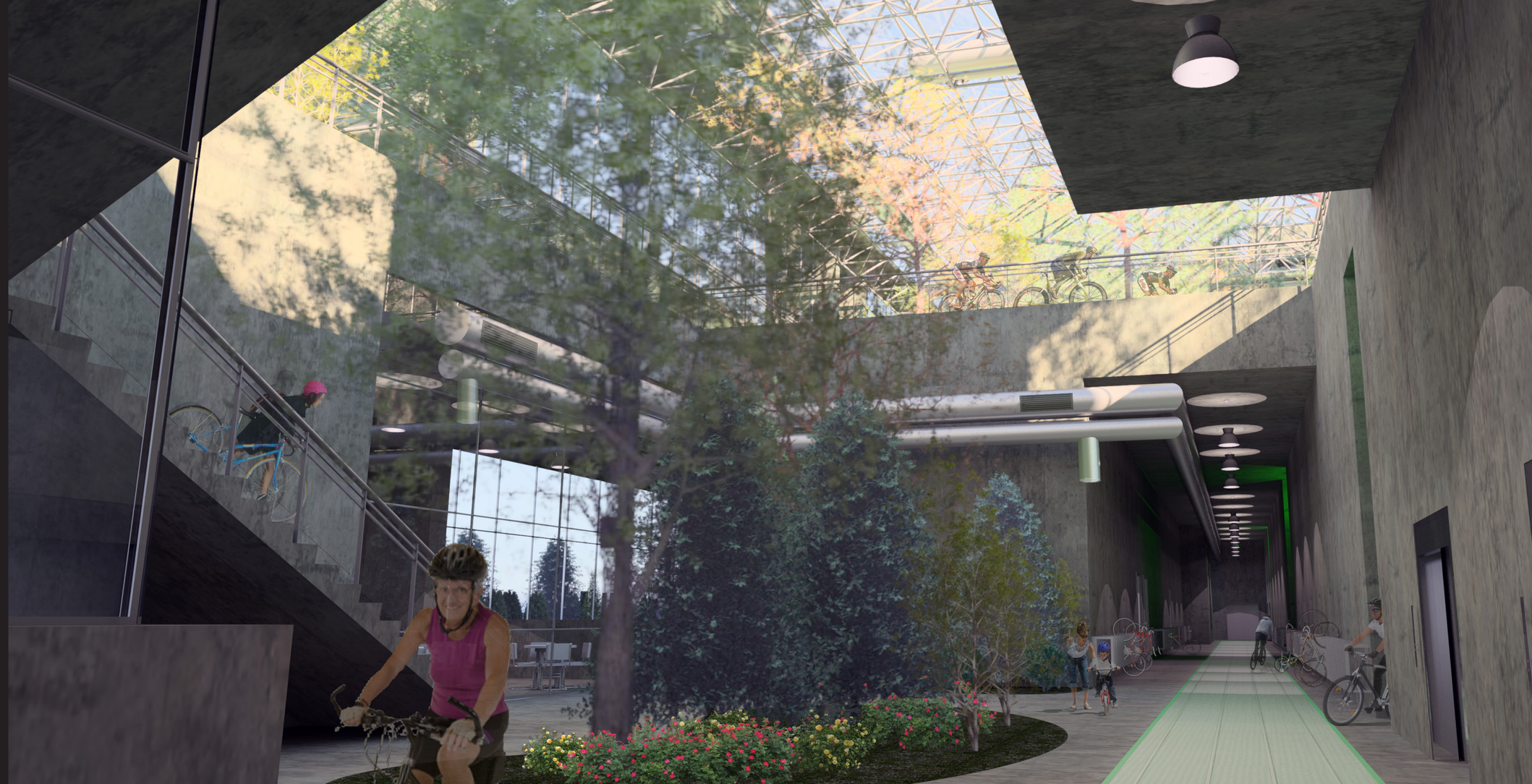


Figure 86
Lower Atrium
by Casey Cotcamp

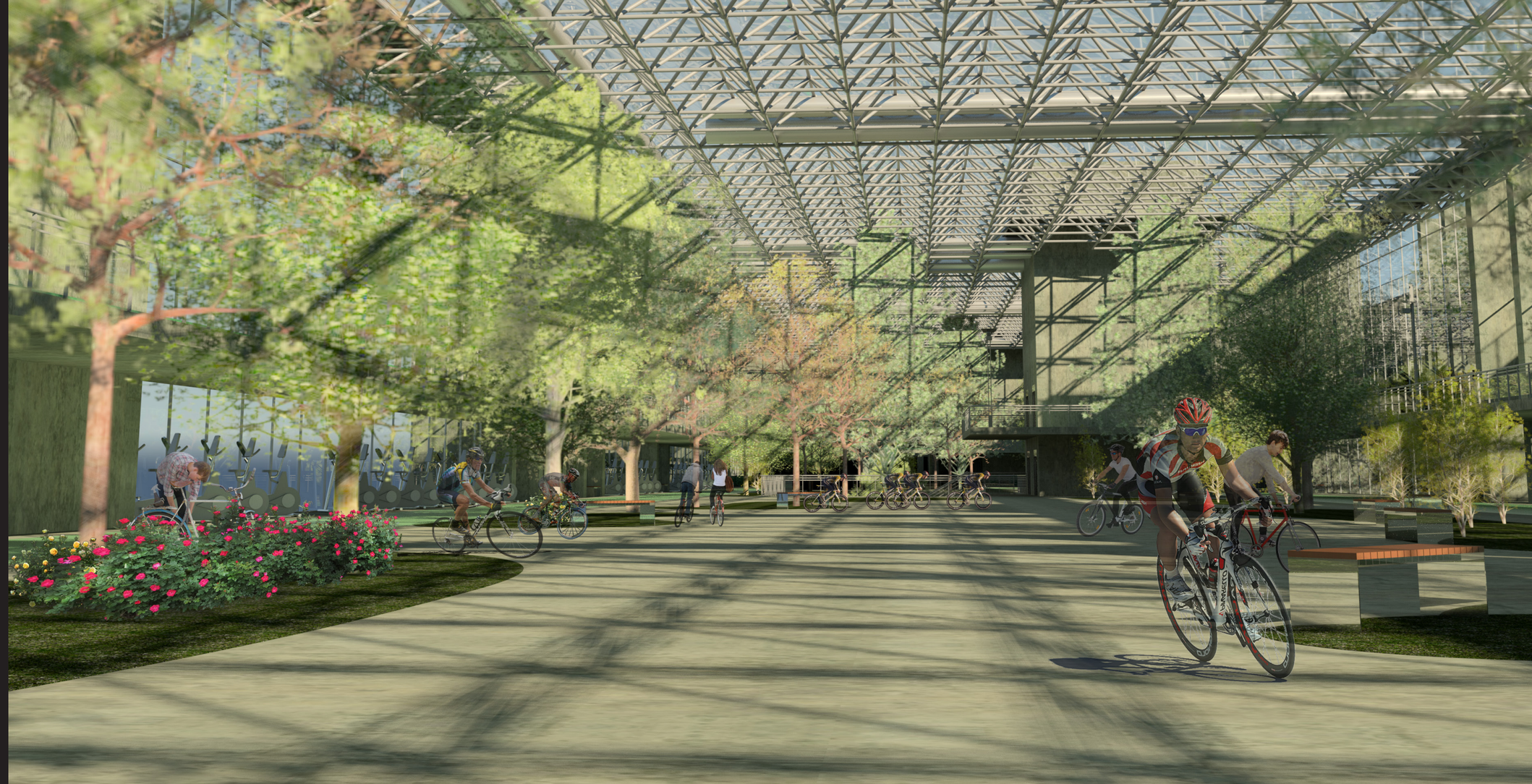


Figure 87
Club
by Casey Cotcamp

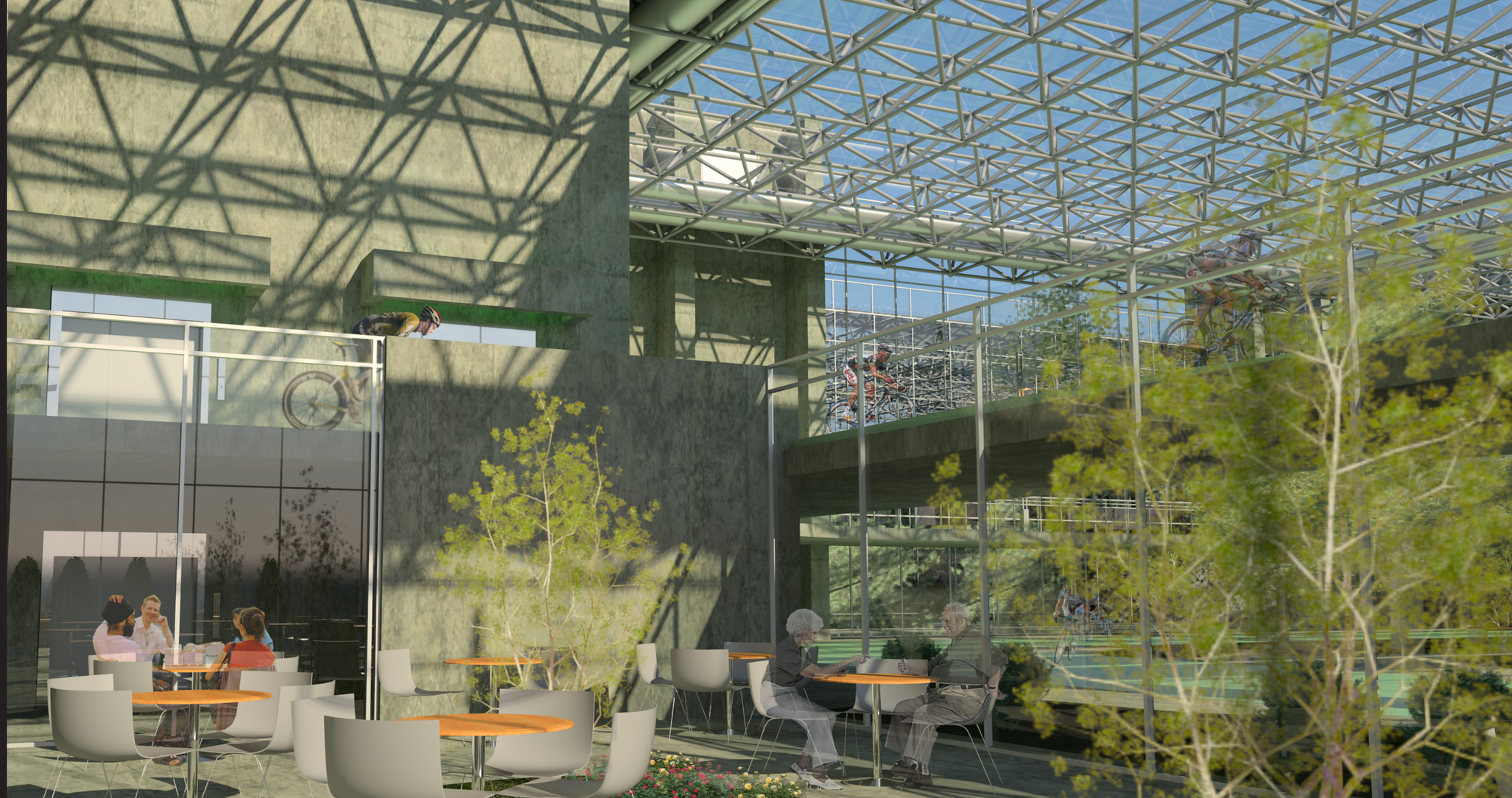
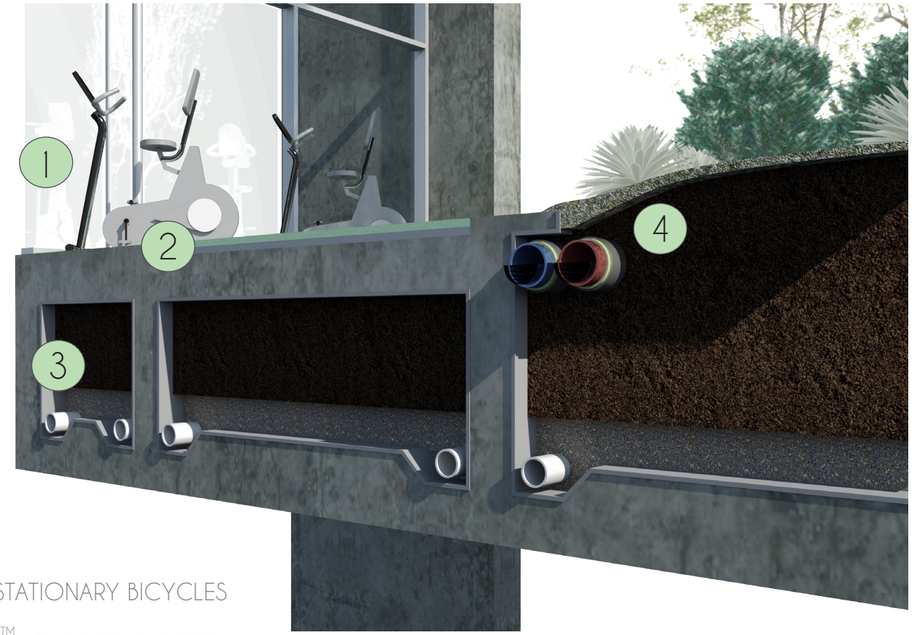


Figure 88
Cafe
by Casey Cotcamp

Figure 89
Track
by Casey Cotcamp

SECTION CALLOUT

Figure 90
Callout
by Casey Cotcamp



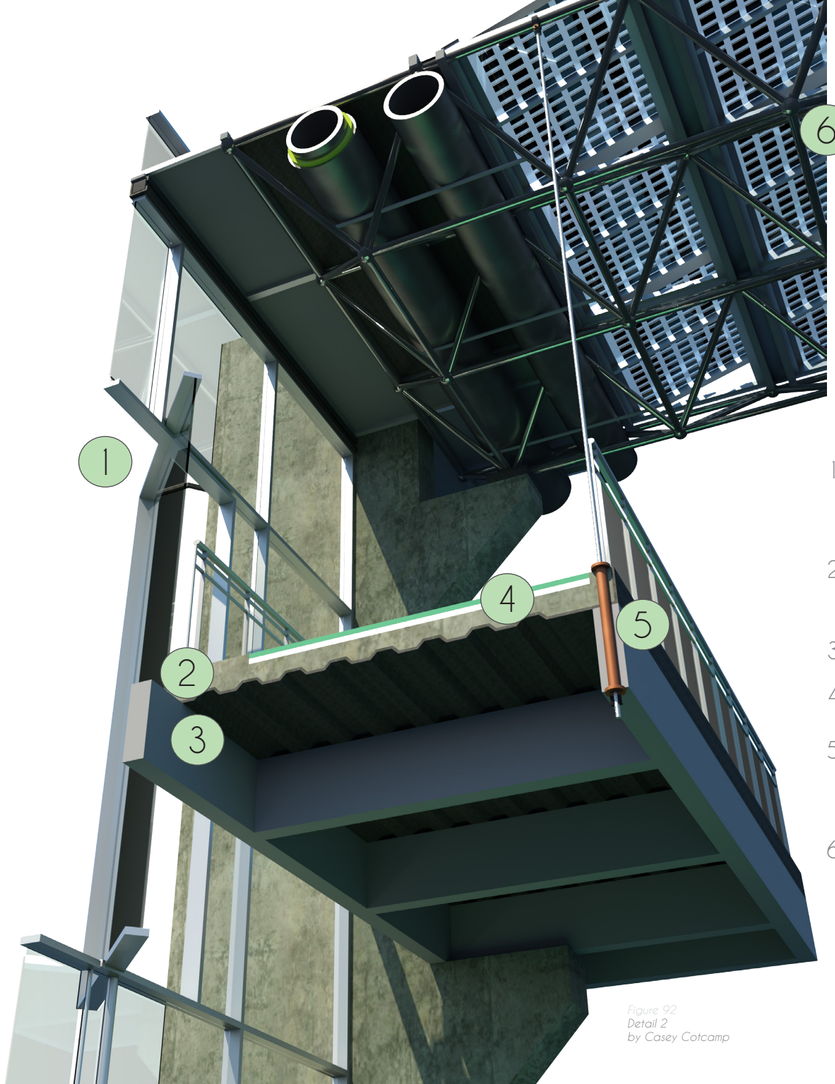
1. KINETIC STATIONARY BICYCLES

2. PAVEGEN™ FLOORING SYSTEM

3. SOIL SYSTEM
   - ROOT STRUCTURE AND DIRT
   - DRAINAGE PIPES
   - GRAVEL
   - WATERPROOF MEMBRANE
   - 5' - 0" DEPTH

4. HOT & COLD WATER SUPPLY

Figure 91
Detail 1
by Casey Cotcamp



1. OPERABLE WINDOW LOUVER
   - NATURAL VENTILATION FOR WARM WEATHER

2. LIGHTWEIGHT CONCRETE ON METAL DECK

3. BOX FRAME TRACK SUPPORT

4. PAVEGEN™ FLOORING SYSTEM

5. SUSPENSION CABLE
   - SUPPORTS BOX FRAME
   - SPACE FRAME CONNECTION

6. PV GLAZING PANELS (INTERIOR)
   - ALLOWS LIGHT TO TRANSFER
   - MAXIMIZE VEGETATION ACCESS TO LIGHT

Figure 92
Detail 2
by Casey Cotcamp

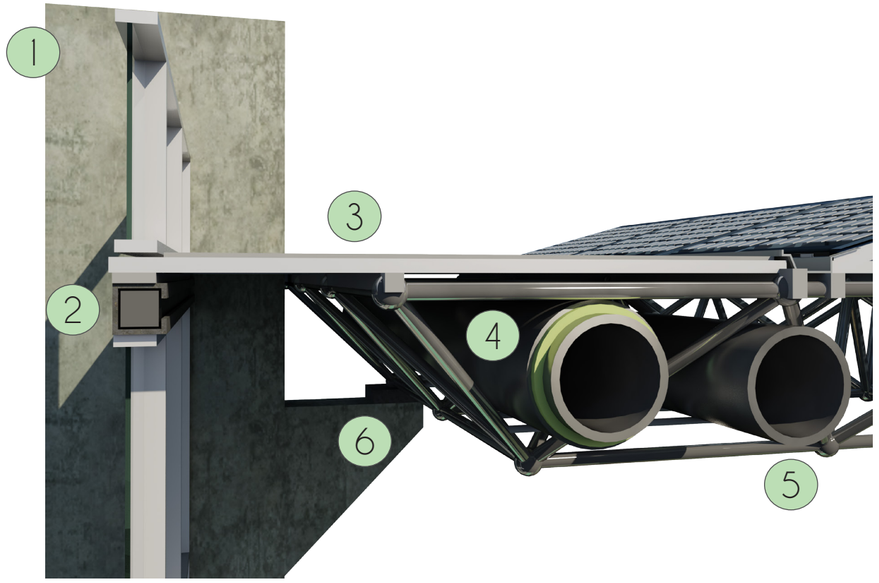


Figure 93
Detail 3
by Casey Cotcamp

1. CONCRETE TOWERS

- 2' - 0" DEPTH
- 12' - 0" WIDTH
- 90' - 6" LENGTH
- FOOTING: 8' - 0" DEPTH
  20' - 0" WIDTH
  4' - 0" LENGTH

2. CURTAIN WALL SUPPORT

3. ROOFTOP MAINTENANCE WALKWAY

- PANELS CAN BE REMOVED AND EXCHANGED
- EASILY ACCESS HVAC DUCTS
- MAINTAIN AND SERVICE EXTERIOR BUILDING ENVELOPE

4. SUPPLY AIR

5. RETURN AIR

6. SPACE FRAME RESTING PAD

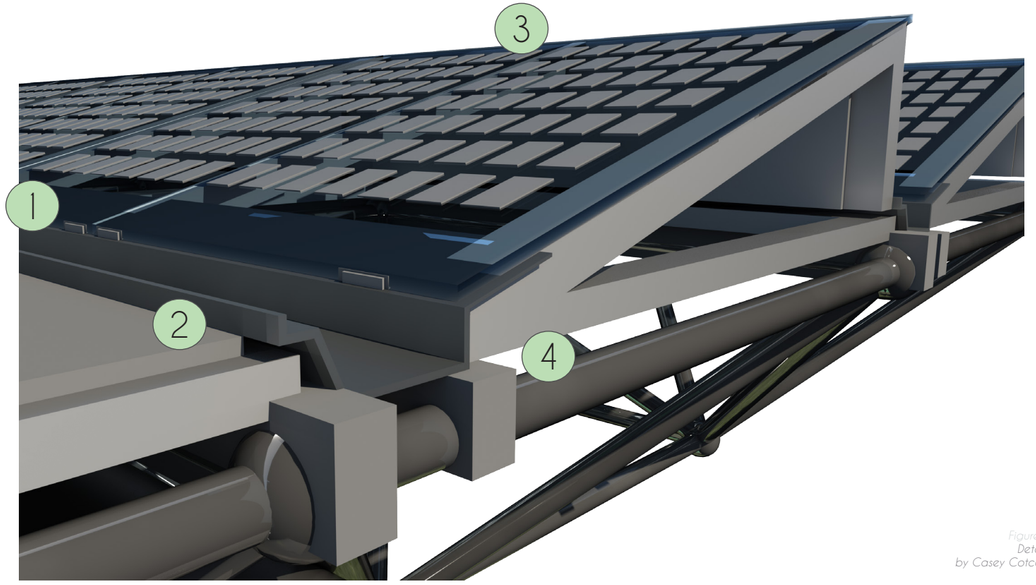


Figure 94
Detail 4
by Casey Cotcamp

1. PV GLAZING PADDING

2. WATER COLLECTION

- PLACED AT FOOT OF EACH PV GLAZING PANEL
- DIRECTS WATER TO COLLECTION TANKS
- USED FOR MAINTAINING PLANTS
- FLASHING WRAPS UP AND UNDERNEATH PV GLAZING PANELS

3. PV GLAZING PANELS (EXTERIOR)

- ANGLE AT 37.3% (MINNEAPOLIS)
- POSSIBILITY FOR 44.7% EFFICIENCY

4. SUPPORT

- RESTING PAD FOR ROOF COMPONENTS

AVERAGE ANNUAL RAINFALL - MINNEAPOLIS, MN

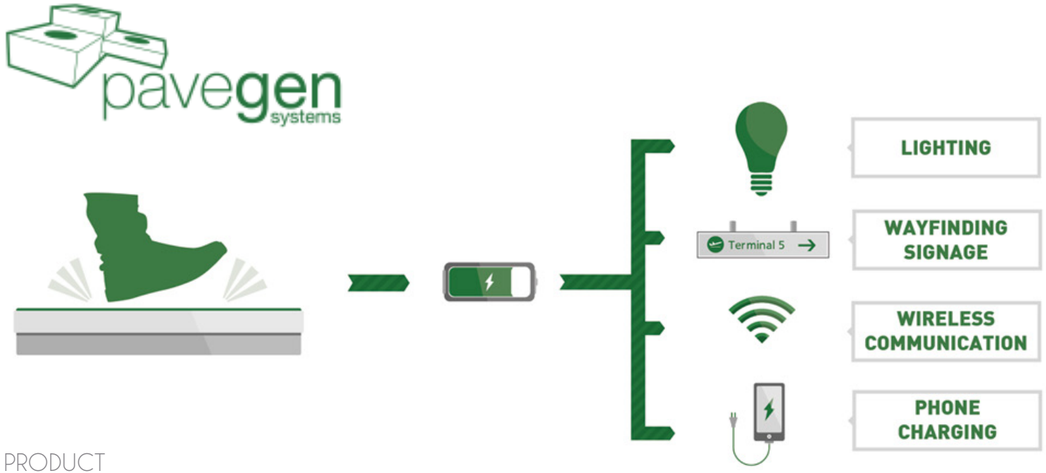
33 INCHES

PEDAL CLUB
SURFACE AREA OF WATER COLLECTION:

123,705 S.F. = 17,813,520 SQ. IN.

AVERAGE ANNUAL WATER COLLECTION:

587,846,160 CUBIC INCHES = 2,544,789 GAL. OF WATER



THE PRODUCT

The energy harvested by the Pavegen tile can immediately power off-grid applications such as pedestrian lighting, way-finding solutions and advertising signage or be stored in an on-board battery in the unit.

Power: 12 Volts DC
Up to 7 Watts per footstep

+/- 400 BICYCLES = APPROX. 2,800 / SEC

Figure 95
PaveGen 1
by PaveGen LTD
(www.pavegen.com)

One Footstep...

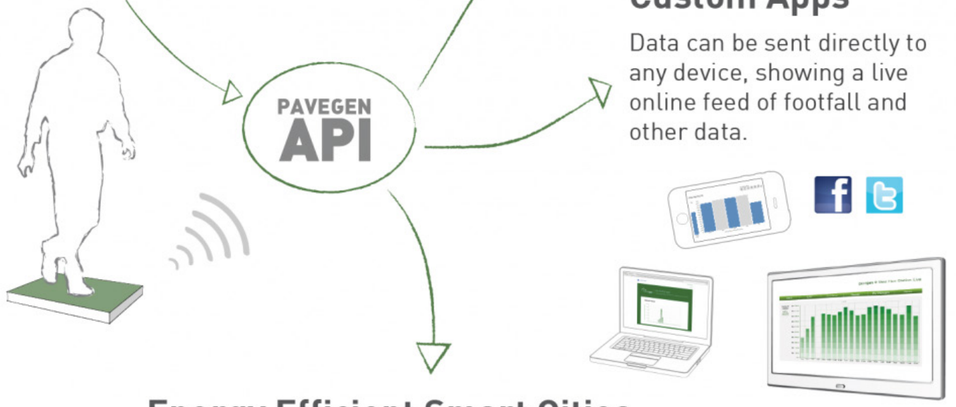
From each footstep, energy is generated and sent wirelessly to Pavegen's API

Data Capture

Pedestrian movement and tracking live energy information.

Custom Apps

Data can be sent directly to any device, showing a live online feed of footfall and other data.



Energy Efficient Smart Cities

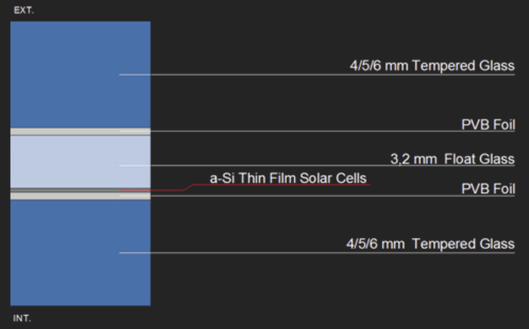
The possibilities for this technology are limitless and are a key part of the smart cities of the future.

Off-grid efficient energy generation
Engaging for the public
Low carbon Suitable for new developments

Figure 96
PaveGen 2
by PaveGen LTD
(www.pavegen.com)

- Sizes adapted to construction standards
- No limits of color or semitransparency
- Fully integrable and combinable with any other construction material
- Fits perfectly into Ventilated Façades, Skylights, Walkable Floors, Brise Soleils, Canopies, Windows, Curtain Walls, Balconies...

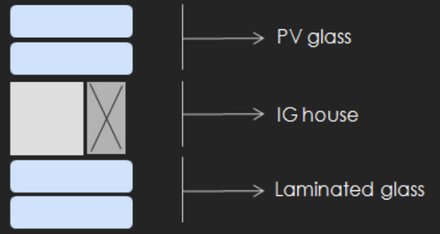
SKIN GLASS
3,2 mm + 3,2 mm



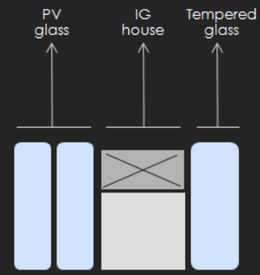
1650 x 850 mm
65" x 33 1/2"

36 cells

DOUBLE GLAZED FOR SKYLIGHT
PV GLASS + AIR CHAMBER + LAMINATED GLASS



DOUBLE GLAZED FOR CURTAIN WALL
PV GLASS + AIR CHAMBER + TEMPERED GLASS



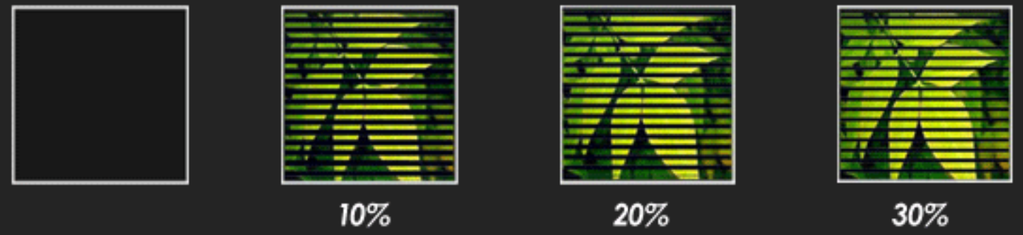


Figure 97
Onyx Glass Collection
by Onyx Glass
(www.onyxsolar.com)

VISIONWALL®

Introduction

For too long, conventional window systems have been the weak link in a building's thermal envelope. As the image on the right illustrates, there are a number of challenges that a window or curtain wall system faces in order to be truly energy efficient.

VISIONWALL®'s innovative window technology allows architects and building owners to create buildings with large expanses of glass without sacrificing energy efficiency. It offers the ideal combination of high thermal insulation, low shading coefficient, high visible light transmission and excellent sound attenuation. Visionwall windows and curtain walls have high insulation values. R-values from 5 to 8.

This allows you to:

- Reduce HVAC equipment costs
- Eliminate the need for perimeter heating
- Design larger glass areas
- Decrease energy consumption in your buildings
- Increase condensation resistance

They also have low shading coefficients, high visible light transmission and STC values from 36 to 45. You can use a wide selection of glass and film combinations to fit every design requirement. This means you have: Improved sound attenuation - quiet interior spaces Raised occupant comfort and productivity

Visionwall® is the leader in engineering and manufacturing of factory preglazed high performance window, curtain wall, and skylight glazing systems. Based upon European technology, these systems have been continually refined and expanded to meet both today's and tomorrow's energy conservation codes.

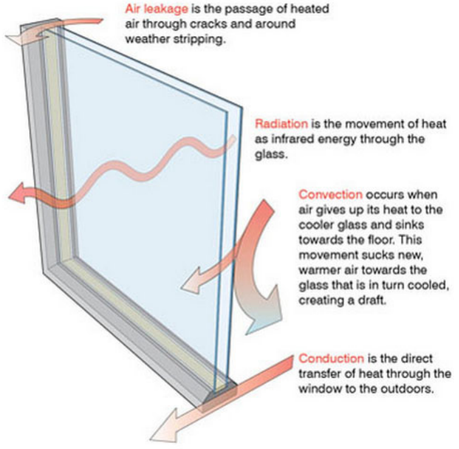
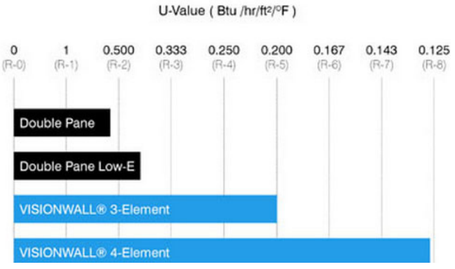
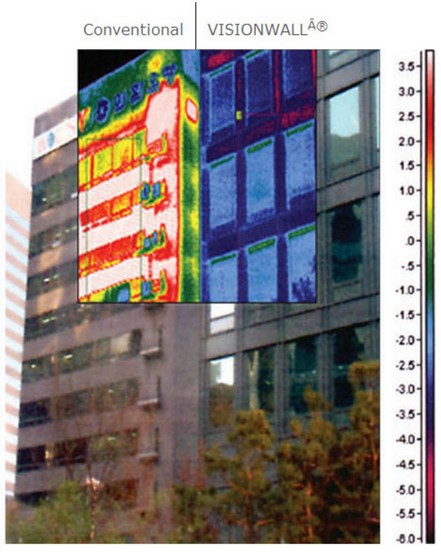


fig 2.1.1 - Fenestration Dynamics

This innovative technology enables architects and building owners to create buildings with large expanses of glass without sacrificing energy efficiency. Its flexibility has been demonstrated worldwide in hundreds of projects.

Buildings that use VISONWALL® systems require less energy to heat and cool (reducing CO2 emissions), are more comfortable, quieter, and cost less to construct because of savings from the reduced scale of heating, ventilation, and air conditioning (HVAC) systems.



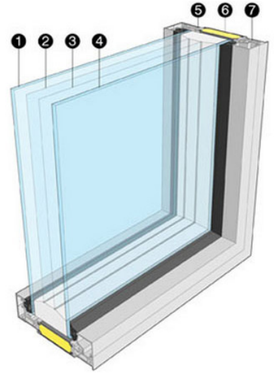


VISIONWALL® 4-Element Glazing Unit

Developed in Switzerland and introduced into the North American market in the 80's, this glazing unit combines two optically clear films internally suspended between two lites of clear, tinted or reflective glass to create three insulating air spaces. This results in the highest glazing unit R-values (between R-4.0 and 7.1) without reliance on inert gas fills.

VISIONWALL® 4-Element System

1 - Clear Glass (Interior) (low-e coating optional)
2 - Suspended, optically clear film
3 - Suspended, optically clear film
4 - Clear, tinted or reflective glass (low-e coating optional)
5 - Extruded aluminum outer frame member (any finish)
6 - Polymide thermal break
7 - Extruded aluminum inner frame member (any finish)



VISIONWALL 4-ELEMENT
Glazing System Performance Data

Low-E Coated Outer Lite
Grey Tinted

U Value: 0.144 R Value: 6.9
Solar Heat Gain Coefficient (SHGC): 0.152

Figure 98
VisionWall Collection
by VisionWall
(www.visionwall.com)

PEDAL POWER

STATIONARY BICYCLES THAT COMBINE MOVEMENT AND FORCE TO CREATE ELECTRICITY

Send electricity right back to your building (much more efficiently than charging batteries)

Feel great knowing your efforts are making the world a better place

Be on the cutting edge of renewable energy technology and innovation

Charge your phone, tablet, or laptop with barely any effort

Bike generator pedaled by a reasonably fit person can produce about 100 watts of continuous output. An experienced biker can produce a peak of more than 400 watts, but peaks don't count for much when it comes to pedal power generators. Assuming an ambitious exercise period of one hour, a person could produce about 100 watt-hours of electricity.

That is one-tenth of a kilowatt-hour (1 kilowatt-hour = 1,000 watts for 1 hour).

Figure 99
Kinetic Bicycle Collection
by Kinetic Cycles
(www.kineticcycles.com)

Figure 100
Generator Cycle
by Low Tech Magazine
(www.lowtechmagazine.com)

Figure 101 & 102
Power Cycle
by Clean Technica
(www.cleantechnica.com)

Figure 103
Nice-Ride 1
by CRS
(www.csmn.info)

Figure 104
Nice-Ride 2
by Nice-Ride MN
(www.chicagonow.com)

Figure 105 - Next Page
Final Rendering
by Casey Cotcamp


BASSETT CREEK
PEDAL CLUB

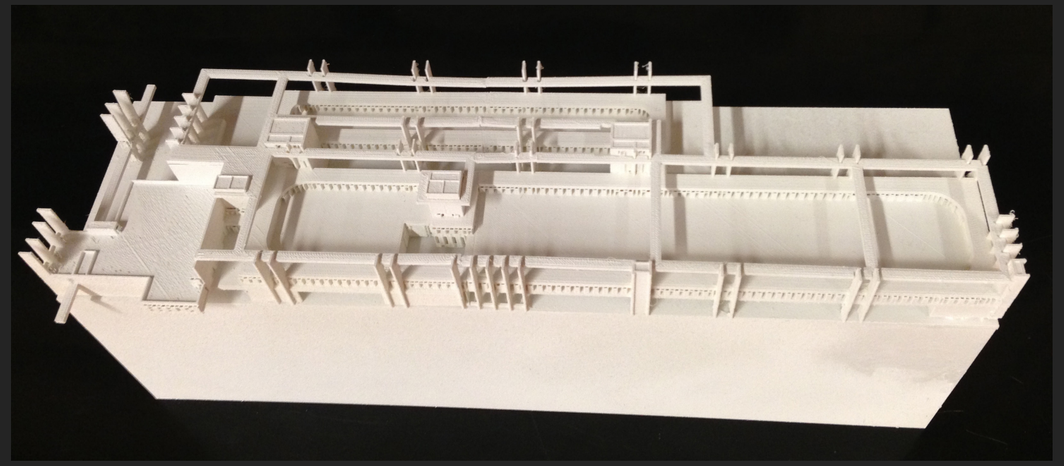


Figure 106
Model 1
by Casey Cotcamp

Figure 107
Model 2
by Casey Cotcamp

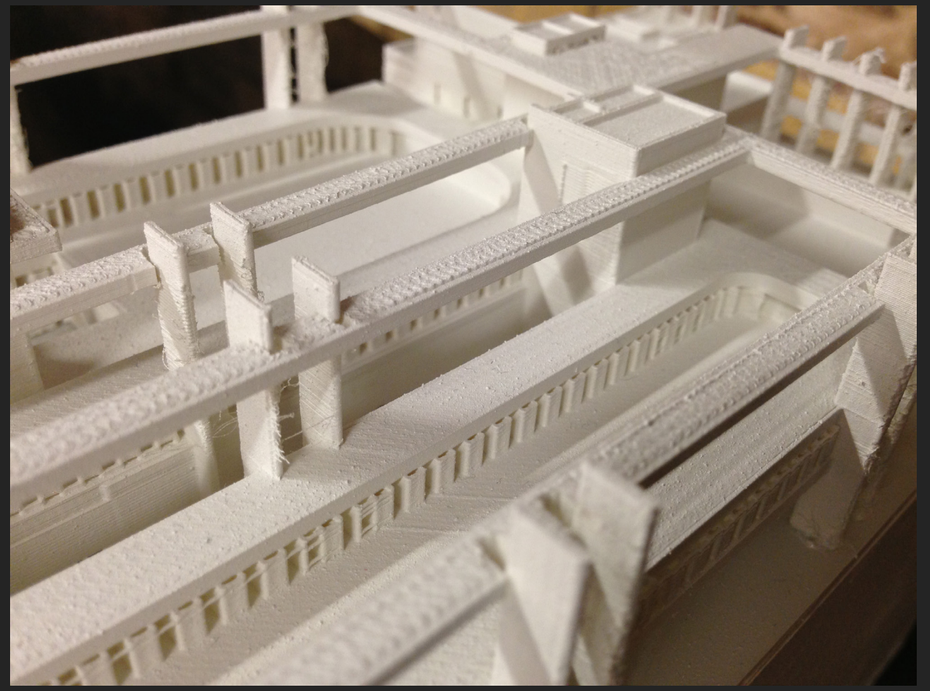


Figure 108
Model 3
by Casey Cotcamp

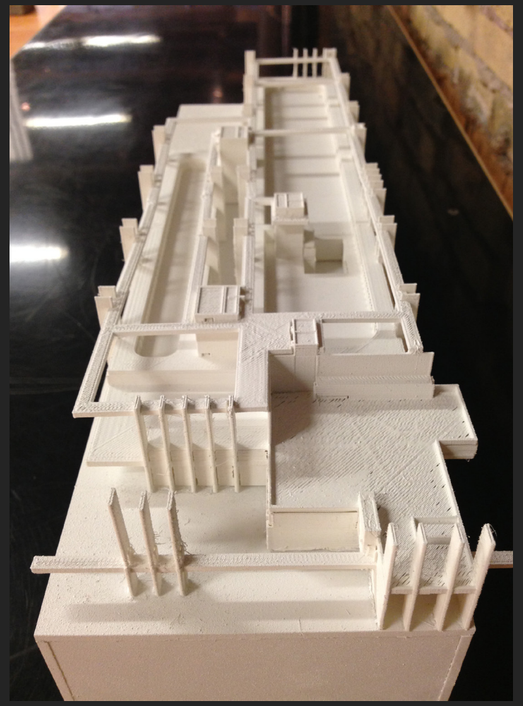
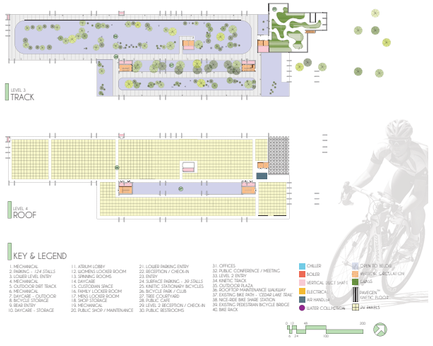


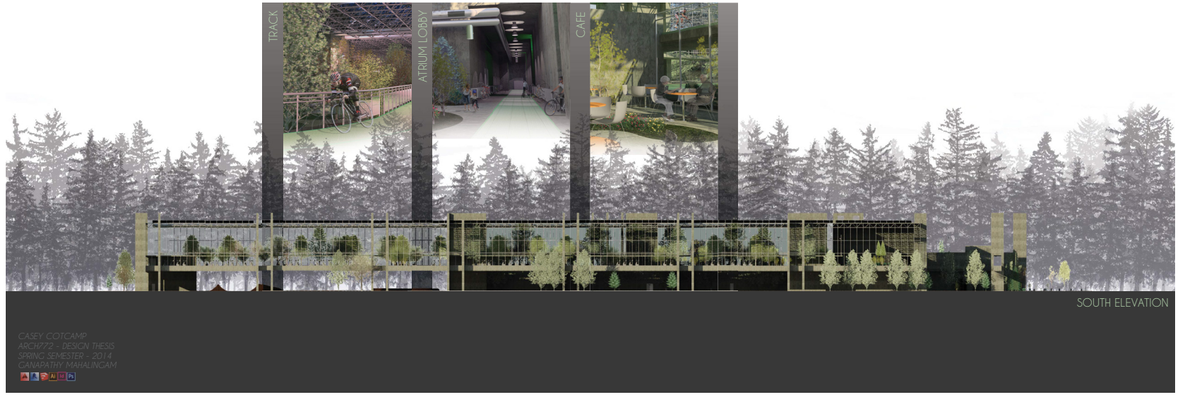
Figure 109
Model 4
by Casey Cotcamp

Figure 110
Model 5
by Casey Cotcamp

Figure 111
Board Presentation
by Casey Cotcamp

Understanding a specific need of the public is very important when looking at how a building can promote a healthy lifestyle, while saving energy and bringing a community closer together. Minneapolis, Minnesota, along with having some of the most extreme weather conditions in the world, lacks a solution for the harsh winter months for bicyclists. This thesis takes a close look at providing the Minneapolis metro area community with an intramural cycling environment that's able to be used year-round.





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SPRING SEMESTER - 2014
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QUOTE

"Once you decide on your occupation... you must immerse yourself in your work. You have to fall in love with your work. Never complain about your job. You must dedicate your life to mastering your skill. That's the secret of success... and is the key to being regarded honorably."

- Jiro Ono

Figure 211
Portrait
by Casey Cotcamp

BASSETT CREEK PEDAL CLUB